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VOL. V APRIL, 1922 No. 4

CONTENTS

INSTRUMENTS FOR MEASURING DISCIPLINARY VALUES OF STUDIES ..... E. L. Thorndike 251

THE COLLECTION OF UNRECORDED SPECIFICS ..... W. W. Charters 280

RELATIVE PROGRESS OF VII-B GROUPS SELECTED ON THE BASIS OF ABILITY ..... W. W. Theisen 295

THE "LIST" VERSUS THE "SENTENCE" METHOD OF TEACHING SPELLING ..... W. E. Hawley and Jackson Gallup 306

AN AID TO THE ANALYSIS OF VOCATIONAL INTERESTS ..... J. B. Miner 311

INTELLIGENCE AS RELATED TO NATIONALITY Gilbert L. Brown 324

EDITORIALS 328

REVIEWS AND ABSTRACTS 333

NEWS ITEMS AND COMMUNICATIONS 343

EDUCATIONAL RESEARCH ASSOCIATION 354

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JOURNAL *of* EDUCATIONAL RESEARCH

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INSTRUMENTS FOR MEASURING THE DISCIPLINARY VALUES OF STUDIES[1]

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The transfer of mental training and the disciplinary value of studies are topics which deserve much more investigation and experimentation than has been given to them. Almost all scientific workers in psychology and in education will agree with this statement and could produce many arguments in its support. These I shall not rehearse, but I may add one new argument, namely that the direct practical utilities and informational values of school studies, which we contrast with their disciplinary values, seem to operate with very rapidly diminishing returns. For example, to know the first thousand English words in importance is an enormous advance over knowing none, but with each succeeding thousand the utility drops rapidly. Learning the eleventh thousand, say in Grade IX, doubtless adds much, but a man can be an excellent citizen, parent, friend, and worker without them. Words in the twenty-first thousand, learned say in college, will, with the exception of those concerned with the individual's specialty, be seen or heard very, very rarely by those who have learned them. In algebra, certain abilities such as the ability to understand simple formulas or to read a graph expressing the relation of one variable to another, are very often useful in general reading and the study of the sciences, but, as with vocabulary, the utility decreases very rapidly as we extend algebraic knowledge. This seems true of many other studies, the curve of direct utility being of the general form of Figure 1. Hence even

[1] The work reported in this article was aided by a grant from the Commonwealth Fund.

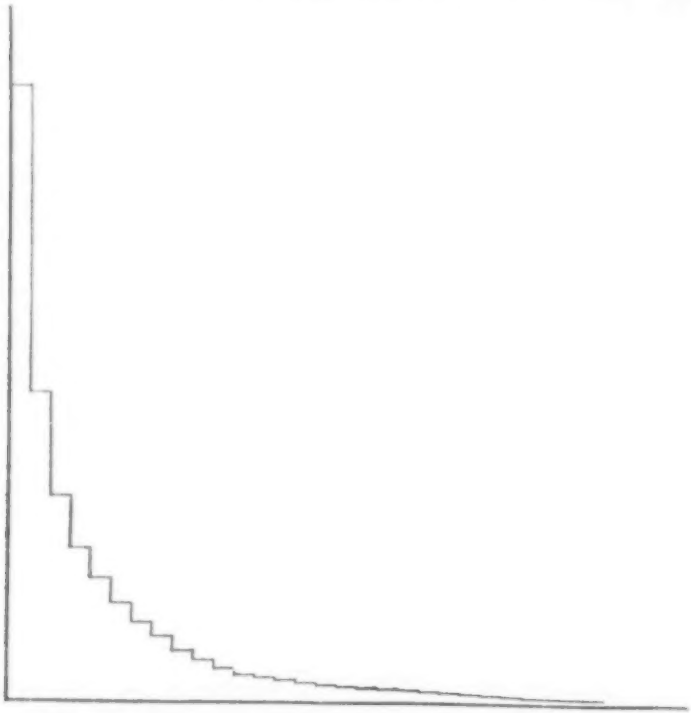


FIGURE 1.—GENERAL FORM OF THE CURVE OF DIRECT UTILITY

a very small amount of transfer effect may equal in importance the direct utilities after a certain point in the latter.

In order to facilitate investigations of the transfer effects or disciplinary values of algebra, we have sought to provide means of measuring them. It appeared that the study of algebra might be expected, in so far as it improved more general abilities at all, to improve the ability to think with symbols, to understand and apply generalizations, to discern and use relations, to select essential facts or elements, and to organize facts for a purpose—in James' phrase to "think things together." The claims made by advocates of algebra as a form of training seem to fall under these heads; and psychological deductions lead in the same direction. Consequently we tried to find or construct instruments for measuring these abilities (which we may call symbolism, gen-

eralization, relating, selection, and organization) with algebraic data and with data remote from and unlike the numbers, letters, formulae, equations, problems, and curves of algebra.

In the course of this work the question arose whether, by slight sacrifices in respect to their fitness to measure general intellectual improvement due to the study of algebra, these same instruments could not be made useful for measuring the general intellectual improvement due to the study of English grammar, or Greek, or Latin, or geometry, or arithmetic.

This seemed to be the case, and the tests as they appear later in this article are offered as useful to measure the general improvement in generalization, relating, selection, and organization produced in a pupil in Grades VII to XII by the study of grammar, languages, or mathematics. A special instrument for measuring the training in symbolism due to algebra has been devised. It is of doubtful value for other studies and is not presented here.

Consideration was given to extending the tests to include ability in discriminating fine and subtle differences, in classification, in detecting and remedying errors in reasoning, and in selecting and arranging facts for arguments and proofs. It seemed advisable however to delay this work until we knew whether the tests so far made proved themselves useful.

The tests are made up in two series, A and B. These are to be given to the experimental groups before and after whatever training is in question and, at similar dates, to the groups used as controls. A practice series is also provided. It is to be given before both the 'early' and the 'late' trials to make sure that the nature of each task is understood. Series A and B are, of course, too long to be printed in full here,[2] but enough of the A series is presented to show the nature of the instrument.

We have not been able as yet to carry on the experimentation necessary to determine the comparative difficulty of the A and B series, element by element. We hope to do this later, but may

[2] They are printed as four eight-page booklets, 8½x11, and a practice booklet of eight pages. They will be supplied at cost by the Institute of Educational Research, Teachers College, Columbia University ($18.00 per hundred sets, including keys for scoring).

not. As totals they are presumably very closely equal in difficulty, and a collection of all the elements of A having mathematical content will probably be very closely equal to a corresponding collection from B. The same holds good for a collection of the elements having specially verbal content, and for a collection of the two pictorial tests and the analogies test. Knowledge of the difficulty of corresponding elements in the A and B halves is not essential, since the comparison is between the gains of the group having the training in question and those of the control group lacking the training.

It is of course the case that Part I does not measure ability in selecting essentials, unmixed with any other ability, that Part II does not measure ability with relations unmixed with any other ability, and similarly for Parts III and IV. On the contrary each part measures a mixture of abilities. It seemed better, however, to use tests that are known to measure abilities of consequence, than to run the risk, in devising tests to isolate certain sorts of ability, of measuring something artificial and possibly unimportant. We do not even know that such isolation is possible. Moreover, the general effect of Latin, or arithmetic, or algebra upon the score in the aggregate of these tests is, in and of itself, well worth study, even if our arrangement of them in respect to the four abilities is entirely in error. Inspection of the samples shown below will provoke the query, "Is not this collection of tests substantially an examination of intelligence? Many of its elements are stock features in such examinations; and the others look as if they would be suitable there."

This instrument is, in fact, a collection of tests all of which are known to be correlated with and indicative of intellect; the chief differences between it and a random selection of tests of intellect is that it omits information tests, vocabulary tests, learning tests (such as substitution tests), tests in which memory counts notably (such as the Army Alpha 1, or Beta 5) and tests of the comprehension of fairly long paragraphs. That tests suitable for our purpose should also be indicative of intelligence is not surprising, since the five abilities in question are

among the most important, if indeed they are not actually the most important, of the group of abilities which we call intellect. An examination for general intelligence would be notably defective if it did not test them. Conversely an examination of the influence of linguistic and mathematical training upon more general abilities would be notably defective if it did not resemble an intelligence examination in many respects. It would not be grossly unfair to measure their transfer effects by giving one of the standard forms of intelligence examination before and after the training in question and to a control group. It is, however, obviously better to omit information tests, vocabulary tests, substitution tests, and tests involving memory; it is also better to select the tests from the point of view of the alleged general training given than to use tests chosen for the correlation of their combined score with some criterion of intelligence. In addition we have tried to make the instrument better for its purpose than existing tests of general intelligence by providing in each part a test with mathematical content, one with verbal content, and one which is not specially mathematical or verbal in its content.

PARTS I AND II.—SELECTIVE AND RATIONAL THINKING

Test 1. Twenty-one Arithmetical Problems

"Find the answers to these problems. Write the answers on the dotted lines. Use the blank sheets to figure on." Nos. 1, 4, 7, 10, 13, 16, and 19 are:

1. What is the cost of four tickets at 50 cents each? Answer.....
4. How much will 24 lemons cost at 30 cents a dozen? Answer.....
7. At 6 for 25c, what is the cost of 3 dozen? Answer.....
10. What number minus 7 equals 23? Answer.....
13. 4 percent of $600 equals 6 percent of what amount? Answer.....
16. A family spends $600 on rent, $3,000 on other expenses and saves $200. If they increase their total expenses to $4,200 and their savings in the same ratio, how much will they save? Answer.....
19. Jofas are 4 for 25c. Kelas are 2½c each.
A Jofa costs.....as much as a Kela.

Test 2. Sixteen Absurdities (Thorndike after Woodworth)

"Write '*imp*' before each statement that could not possibly be true. Write '*poss*' before each statement that might possibly be true (even if it is not probable)." Nos. 1, 4, 7, 10, 13, and 16 are:

.....1. Each singer shouted at the top of his voice, but the big fat man with the red necktie could be heard above all others.

.....4. The poor wanderer, finding himself without means of lighting his camp fire, made a fruitless search thru his equipment by the light of a single candle.

.....7. Using a field glass, the captain now clearly perceived what he had previously surmised—a group of mounted men moving cautiously along the river bank on their hands and knees.

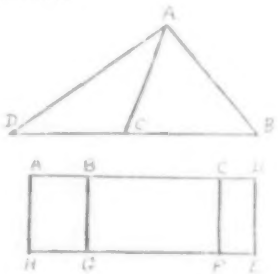
.....10. By the light of a dim lantern, the farmer found the source of the nauseating odor.

.....13. He stood on the dry grass watching the rain, which had been falling steadily for two days and nights.

.....16. Starting half way between two posts, he walked slowly all around the field and each post that he met was shorter than any he previously had passed.

Test 3. Five-line arrangements

1. Draw 6 triangles using only 5 lines. All the triangles in your drawing may be counted to make up the six. For example, in the upper drawing there are three triangles: ABC, ACD and ABD. In the lower drawing there are six rectangles, ABGH, BCFG, CDEF, ACFH, BDEG, and ADEH.



2. Draw 5 squares using only 6 lines.

3. Draw a hexagon, 2 squares, and 4 triangles, using only 9 lines. (Hexagon means a 6-sided figure.)

4. Draw a square surrounded by 4 triangles, using only 6 lines.

5. Draw 10 triangles, 2 squares and a hexagon, using only 11 lines.

Test 4. Thirty-five Wylie opposites

"Look at each of the words in the list below. Then write a word after each one which means just the opposite and which also begins with the letter *b*. If you come to any word which you cannot do, then go on to the next one. These three samples are given as they should be:"

girl — boy
covered — bare
upset — balance

Numbers 1, 6, 11, 16, 21, 26, and 31 are:[1]

1. good	6. white	11. straight	16. loose
21. cultured	26. exhume	31. spiritual	

[1] This particular set may be replaced by another, but the nature of the task and its general difficulty will be the same.

Test 5. Twenty number-series completions
(Thorndike After Rogers)

"In the lines below, each number is gotten in a certain way from the numbers coming before it. Study out what this way is in each line, and then write in the space left for it the number that should come next. The first two lines are already filled in as they should be."

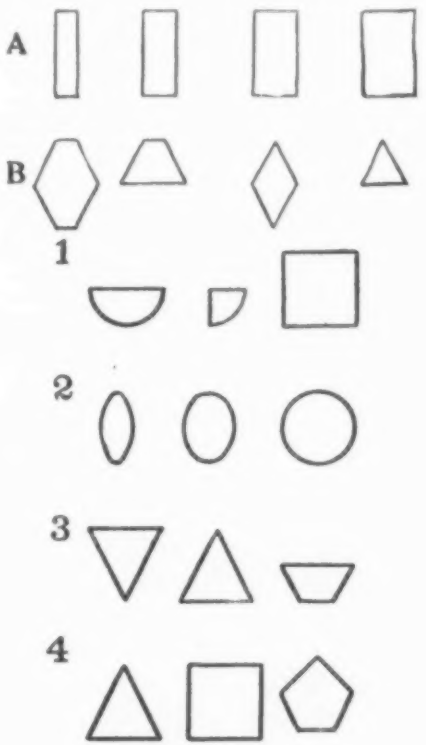
Samples: 2, 4, 6, 8, 10, ...*12*...
11, 12, 14, 15, 17, ...*18*...

Lines 1, 5, 7, 10, 13, 16, and 19 are:

5, 10, 15, 20, ...
103, 95, 87, 79, ...
5½, 7, 8½, 10, ...
21⅕, 21⅖, 21⅗, 21⅘, ...
10, 12, 12½, 14½, 15, 17, ...
1 7/16, 1⅜, 1 9/16, 1¾, ...
7, 9, 10, 11, 13, 14, 15, 17, ...

Test 6. Geometrical relations (Thorndike)
(Two sets of ten each)

"In lines 1 to 10 draw a fourth figure in each line such that the fourth figure is to the third as the second is to the first, as shown in lines A and B."



Test 7. Thirty-two verbal analogies or relations
(Thorndike, selection and extension from Briggs)

"Write on the dotted line a word which fits the third word in the same way that the second word fits the first word. The samples show what you are to do."

Samples	long	longer	bad	*worse*
	push	pushed	run	*ran*
	boy	boys	ox	*oxen*

Nos. 1, 6, 11, 16, 21, 26, and 31 are:

1.	child	child's	Poll and Hunt	.....
6.	cook	cook's	Burns	.....
11.	wings	wing	they	.....
16.	driver's	drivers'	my	.....
21.	stones	stone	strata	.....
26.	prepare	preparation	flee	.....
31.	fit	fitness	young	.....

Test 8. Forty analogies or mixed relations
(Thorndike, after Army Alpha, after Woodworth-Wells)

"In each of the lines below, the first two words have a certain relation. Notice that relation and draw a line under the *one* word in the parenthesis which has that particular relation to the third word. Begin with No. 1 and mark as many sets as you can."

Samples
sky—blue: grass (grow, *green*, cut, dead)
fish—swims: man (boy, woman, *walks*, girl)
day—night: white (red, *black*, clear, pure)

Nos. 1, 10, 20, 30, and 40 are:

1. eat—bread: drink (water, drunk, chew, swallow)
10. tiger—wild: cat (dog, mouse, tame, pig)
20. poison—death: food (eat, bird, life, bad)
30. birth—death: planting (harvest, corn, spring, wheat)
40. advice—command: persuasion (help, aid, urging, compulsion)

PARTS III AND IV.—GENERALIZATION AND ORGANIZATION

Test 1. One half of the Pressey moral judgment test

(12 lines). "In each line cross out the word that does not belong."

Lines 1, 4, 7, and 10 are:

1. borrowing, gambling, overcharging, stealing, begging.
4. stinginess, carefulness, generosity, charity, economy.
7. stupidity, dullness, foolishness, dishonesty, ignorance.
10. meekness, vanity, self-confidence, self-esteem, self-respect.

Test 2. Twenty selections, each of a member of a class defined by three samples (Thorndike, after Otis)

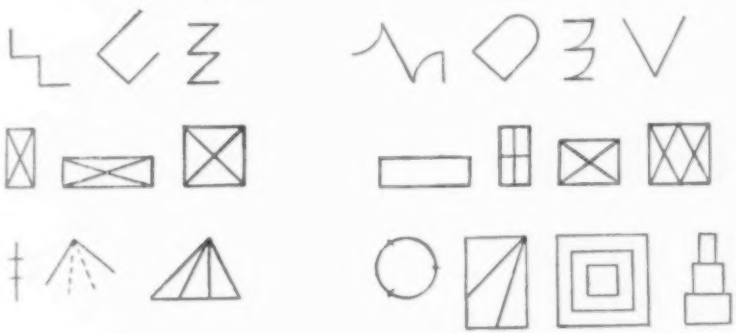
"Look at the words in line 1. Find the way in which the things named by the first three are alike,—the quality or feature which they have in common. Then look at the other four words on line 1, and draw a line under the name of the thing that is most like all the first three,—which has some quality or feature which the first three all have. Do the same for lines 2, 3, 4, 5, etc."

Lines 1, 5, 10, 15, and 20 are:

1.	fat grease butter	melt lard burn fry
5.	clam scallop limpet	shell beach salt oyster
10.	sapphire amethyst ruby	ring sparkle topaz costly
15.	football baseball golf	chess tennis whist bat
20.	north south east	compass wind turn up

Test 3. Ten selections of a member of a class as in Test 2, but with pictures (Thorndike, after Otis)

Lines 1, 4, and 7 are:



Test 4. Twelve selections of a member of a class as in Tests 2 and 3, but with numbers (Thorndike, after Otis)

Lines 1, 4, 7, 10, and 12 are:

21	49	700	800	63	12	94
$6/4$	$15/10$	1.5	$2/3$	$2\frac{1}{2}$	3.0	$\frac{4}{2\frac{2}{3}}$
25	64	10000	1000	9	640	64025
7	26	63	121	122	123	124
27	125	1000	270	1250	64	10000

Test 5. Trabue completions J and L (or K and M)

"Supply the missing words to make each sentence true and sensible. Write only one word in each blank space."

Lines 1, 5, 10, and 15 are:

1. The boy will.....his hand if.....plays with fire.
5. The poor little.....has.....nothing to.....; he is hungry.
10. To.....many things.....ever finishing any of them.....a .....habit.
15. It is.....that a full-grown man should.....a ghost.....he is.....

Test 6. Cutting a surface so as to produce given surfaces (Thorndike, after Army Beta Test 7)

"Think how you would cut the triangle so as to make the pieces shown in 1. Draw a line or lines to show how you would cut it. Do the same for the triangles in 2, 3, 4, 5, etc."

The test Beta 7 is so well known that we do not reproduce samples of the surfaces and parts here.

Test 7. Rearranging data to form a true equation. (Thorndike) Twenty equations

"Write the numbers and signs in each line in the proper order, so that they make a true equation as shown in the three sample lines. Use the loose sheets of paper to figure on if you need to."

Sample lines	3 3 6 = +	3 + 3 = 6
	4 7 8 20 = + ×	7 × 4 = 20 + 8
	2 3 3 7 18 = + − × ( )	7 + 2 = 18 − (3 × 3)

Lines 1, 5, 10, 15, and 20 are:

3 3 4 10 = + −
3 3 8 48 = + ÷
1 3 4 4 12 = + − × ( )
1 3 3 3 3 21 = + − × ÷ ( )
2 2¼ 3 4 5 = + × × ( )

These tests can be given (a) with so short a time limit for each that very few pupils will finish, or (b) with so generous a time limit that very few pupils will fail to do all of which they are capable, or (c) with the requirement to finish all of each test, the time being recorded for each pupil. The tests are made up in booklets for convenient use by method *a*. If method *b* or *c* is used they should be cut up and used separately.

Convenient times for method *a* are stated below. These permit the completion of the examination in two periods of 45

minutes plus a practice period of 20 minutes. Any investigator may, however, alter these at his discretion.

SUGGESTED TIME SCHEDULE FOR METHOD *a*

Parts I and II.—Selective and Relational Thinking

	Minutes
1. Arithmetical problems	10
2. Absurdities	4
3. Line arrangements	4
4. Opposites	5
5. Number series completions	4
6. Geometrical relations	4
7. Mixed verbal relations	4
8. Mixed relations (Woodworth-Wells type)	4
Total	39

Parts III and IV.—Generalization and Organization

	Minutes
1. Pressey moral judgment	2
2. Otis similarities test, words	3
3. Otis similarities test, pictures	3
4. Otis similarities test, numbers	3
5. Trabue completions	10
6. Cutting up surfaces	3
7. Disarranged equations	12
Total	36

A Practice Form for fore-exercise is provided. It is suggested that the Practice Form be given as follows: Tests A to F inclusive, 1 minute 30 seconds each; Tests G and H, one minute each; and Tests I to N, 1 minute 30 seconds each.

At the end any pupil who did not understand the nature of any task may be given a retrial or special explanations if desired. It is intended that in the regular tests only a few seconds should be spent per test in reading and considering the instructions. However, with pupils in Grades IX to XII, for whom this instrument is especially designed, the use of the Practice Form will almost always be adequate to ensure this.

THE COLLECTING OF UNRECORDED SPECIFICS

W. W. Charters
Carnegie Institute of Technology

In an article appearing in Educational Administration and Supervision, May, 1918, the writer advocated a method of collecting specific methods of instruction. To this the interested student may refer for the setting of this paper, while the attention of the reader is directed to the technique by which the collecting of unrecorded specifics is accomplished.

It is obvious that there is a great mass of specifics which, though used by expert teachers with excellent results, are found neither in print nor in any other form available for the teacher. That this material is immensely more voluminous than the recorded specifics is clear only to those who have attempted to make the collection. I hazard the estimate that for one recorded specific in meeting any situation there are five which have not appeared either in print or in writing. Used by the teacher as a part of the secrets of her equipment they have not been called for by others except in oral conversation, and, in the absence of a call, the teacher herself has not written them down nor, frequently, is she able to write them. That they are valuable is evident to those who collect; that they have not been collected is inexplicable.

In the collection of unrecorded specifics there are six steps: a difficulty or duty analysis, the turning of this into questions, the training of interviewers, the interview, the report, and the compilation of reports. For the information of the craft I shall describe in some detail the difficulties and methods involved in collecting information concerning the arts of college teaching, retail selling, handling salespeople, teaching ideals, Sunday School teaching, and superintending Sunday Schools. The description will be informal and somewhat in narrative form, because the development of the methods in our laboratories is recent and time sufficient for systematic retrospect has not yet elapsed. The steps will be discussed serially.

The Difficulty Analysis

Obviously we may attack the problem of collecting specifics in three ways. We may list the *principles* underlying the methods of an act and collect illustrations of the applications of these principles to specific situations. We may temporarily ignore the principles and make a list of the *duties* or *activities* involved in the performance of the task and collect specific methods of performance. Or, we may merely collect the *difficulties* with which the worker is confronted in performing the activities. For instance, we may list the principles of teaching and collect methods of applying them to specific situations; we may make a job analysis of teaching and collect specifics for performing each duty, or activity; or we may make a difficulty analysis, list those duties with which the teacher has found difficulty, and collect specific methods of performance.

Lack of time does not permit any consideration of the relative merits of these three plans but for sufficient reasons we have begun all our studies with a difficulty analysis. This may be a very simple one. For example, the collector may make a list of the difficulties which he happens to remember, as was done by a group of college instructors who, in a seminar on college teaching, made a partial list of their duties and checked those with which they had difficulty. By such means a composite list of fourteen duties was obtained, which included such subjects as interesting students, grading papers, grading students, learning their names, making them work, teaching them to think, apportioning materials so as to have neither too much nor too little at the end of the hour and the semester, and so forth. Clearly the fourteen points do not constitute a complete difficulty analysis, although they were sufficient for treatment at one time.

A somewhat more complete analysis was attempted in retail selling. Salespeople were interviewed to discover their difficulties, but being neither introspective nor reflective, the bucket was drawn empty from the well. They did not know what their difficulties were. The executives of department stores were appealed to with no better results. So, consequently, a member

of the staff, expert in selling, was delegated to secure an analysis by observation. For three months she spent two hours daily in the stores watching salespeople and listing the difficulties which she observed. By this method of observation some sixty difficulties were obtained, which became the basis for collection.

A still more careful analysis was made of Sunday School teaching. The collector in charge first listed all the difficulties of which she could think, she interviewed friends and added to the list, she visited Sunday Schools and observed the teaching, teachers were interviewed, and state and county executives were questioned. Finally a written request was made for difficulties from fifty members of the Committee on Education of the International Sunday School Association. One very interesting technical result was obtained. It was discovered that in every interview and letter up to a total of thirty, new difficulties were found among the list, but after thirty, no new ones appeared. We therefore felt that in so far as our informants were concerned we had completed the job. Whether a more expert group would have added additional difficulties is another question. From all these sources sixty-seven difficulties were secured.

In a fourth case inferiors were appealed to for a difficulty analysis. This was in connection with the difficulties encountered in handling salespeople. When the expert salespeople were being questioned concerning their methods of handling selling difficulties they were asked to state the difference between a good head of a department and a poor one. The resulting replies revealed the difficulties encountered by heads of departments in handling salespeople from the salesperson's point of view. They reported that the poor head could not be firm without being grouchy, nor kind without being easy, that he was partial, did not know his people's names, reprimanded in public, and so forth. To these were added the opinions of superior executives who were asked the same question. At a later date the question was repeated with some heads of departments themselves. From all these sources thirty difficulties in handling salespeople were obtained.

It will be observed from the foregoing descriptions that a difficulty analysis of any completeness requires considerable time and patience. As a matter of fact, the retail selling analysis required two hours a day for three months and that of the Sunday School teacher took the full time of one person for six weeks, although at the same time the major portion of the analysis of the Sunday School superintendent's job was carried on.

The methods used were those of introspection; interview of the worker on the job, his inferiors, and his superiors; and the method of observation. In no case did the analyst use the useful but cumbersome method of learning the job himself.

Translating Difficulties Into Questions

Since the specifics for handling difficulties are to be obtained by interviews it is necessary to throw them into the form of questions. This presents a number of difficulties, a few of which may be mentioned. The questions must be so phrased as to pull the answer. Two or three illustrations will make this clear. One fault of a poor department head is that, in the store vernacular, "he bawls you out before people." If we ask "How do you keep from 'bawling out' your salespeople before customers?" we shall not get as good material as if we ask, "When you have occasion to reprimand, how do you manage to make the point you desire and at the same time avoid resentment and bitterness?" This question will open up the whole problem of reprimanding and give much better results. Another fault of the weak department head is that "he does not show appreciation of the work of those who try." Here the question finally decided upon took this form. "What are your methods of showing appreciation of the efforts of your salespeople? (a) How do you do this without encouraging egotism?" This sub-question concerning egotism was added to spike the guns of some of the "hard-boiled" heads who maintain that if you praise a salesperson "he will strike you for a raise."

A second difficulty is that of making the shades of meaning too fine. Questions must not be pitched above the level of the

discrimination of interviewers and their subjects. For instance, these two questions are too much alike to produce good results: "How do you show your people that you stand for their best interests in salary and growth?" and "How do you show salespeople that you are personally interested in them?" To the framers of the questions there was a distinction between personal interest and interest in merely salary and growth; but our subjects could not see any and the answers were duplicates. The question "How do you determine when you strike the happy medium between too much sternness and too much familiarity?" was important, but it drew only one answer from thirty informants though the reports covered a total of fifteen typewritten pages. The question might have produced better results if it had been phrased as follows: "What are the signs by which you know that you have struck the happy medium between too much sternness and too much familiarity?"

Since the object of the interviews is to obtain methods, the word "How" or a synonym must be used in every one. In thirty questions on handling salespeople, seventeen use the word *How*.

The correct framing of the questions is so important that we always prepare tentative forms and write them on the board to discuss with the interviewers. The questions are torn to pieces, each man defends his modifications, and a second tentative form is decided upon. They are then tried out in interviews and the replies are brought back and read before the final form is decided upon. It is criminal for an interviewer to spend three hours on an interview and report, if the questions are not efficient.

We have not found it advisable in general to frame such complicated general questions that subordinate questions need to be added to bring out the complete answer. It is a much better practice to break such a question up into a number of separate questions. Extreme care, then, must be taken to frame the questions having the maximum drawing power.

Training the Interviewers

To interview properly is a task of some difficulty. An interview may run in the following fashion. The interviewer asks

his question. The subject says, "Well, I don't know how I do that, but—" and at once commences to talk. His mind is open to all sorts of reminiscences and he talks on. The interviewer must catch the methods, for somewhere the informant, consciously or unconsciously, is telling *how* he performs the operation and this must be recognized by the interviewer and rapidly recorded in the picturesque language of the subject. As the interviewer listens he sometimes sees that the subject is talking about experiences which do not bear on the question asked. He then has to bring him back to the point with unlacerated feelings. Perhaps he can be brought back; possibly it cannot be done.

This situation demands several qualities in the interviewer. He must be logically minded; if he rambles himself he will not try to keep the informant to the point. He must be rather facile in directing conversation so as to bring the informant back to the point by breaking in with a question in the least objectionable way. He must have polite persistence in digging in with his questions until he has extracted all that he can get. Yet at the same time he must be quick to recognize the point at which he has drained the pitcher. On the mechanical side he should have no inhibitions against writing full reports of what has been said; for in our experience we find that more than half our amateur interviewers write such meagre reports that they are useless. Even after training, out of a group of eleven interviewers who did considerable reporting only four were excellent, four did fairly well and three were impossible. The good interviewer, then, is one who is logical in his thinking, facile in directing conversation, persistent in digging in, and detailed in his writing.

Our methods of training the interviewers are as follows. We first have them help frame and criticize the questions. The purpose of this is to help them to see the function and implications of the questions and to realize that the wording of questions is a subject of importance. They learn that they can vary the question or re-word it on the spot, and thus better draw out what they want. Before the training is completed we have them write up their own answers for, of course, an interviewer to be efficient

needs to know something about the methods, although there is danger in knowing too much. These are written in the form decided upon and are brought to conference and read. As they are read we invariably find that the interviewer supplements what he has written with additional oral remarks. But this is jocularly and firmly prohibited. Interviewers must write everything on paper that they think should be included because the compiler has only the written accounts from which to compile the reports. This is a very important point; everything to be said must be written. As an interviewer reads a report in conference this question is re-iterated by the compiler to the listeners: "Is this reported in sufficient detail for you to follow it?" Usually it is not and suggestions are made concerning points at which elaboration is necessary. This conference is usually an extended one and at its close the interviewers are asked to revise their reports for the next conference. Usually those who have it in them to interview reveal themselves in the revised reports. Then they are sent out to make the first interview with the selected subjects. The first set of these reports is gone over thoroughly in conference in much the same way, as the preliminary reports. Those people who are selected for interviewing are given no further preliminary training; the others are discarded. In training the interviewers, then, a careful weeding-out process is necessary and careful training in the technique is given.

The Interview

The subjects for the interview are selected because of expert ability. The college instructors who have the best reputations as teachers, the most expert salespeople, the best handlers of men, are located. The methods of selection may vary, but usually we have been compelled to take the opinion of higher executives, who, during long contacts with their subordinates, have come to have a fairly accurate knowledge of the best members of the force. More accurate methods of selection can, of course, be used, although we have not employed them.

When the subject has been selected, he is advised by some one whom he knows that he will be asked to describe his methods, and a set of the questions are given or sent to him. To secure a sympathetic response it is necessary to make the contact quite personal. I may write to a college professor, telling him that I am training young college instructors, and I want to find out how he, with his excellent reputation as a teacher in the college, handles some problems that are bothering these beginners. The president of a firm may gather his selected salespeople together and give them a talk to the effect that, since times are harder, it is necessary for methods of selling to be improved. He points out that even though the salespeople present are excellent salesmen their success is dependent upon the ability of the whole selling force. If customers obtain poor service from incompetent salespeople, they will not return to the store, and the experts will never have a chance to sell to them. They are told that all they have to do is to read the questions over before the interview, think about them, and then talk to a young woman. Particularly is it impressed upon them that *all* they have to do is to *talk*. In any case the idea must be clearly explained to them and their enthusiasm for the project must be enlisted.

It is always advisable to warn the subject beforehand and give him the questions for study. This is important because, even though not one in five study them, the subject has a much better mental set than if the questions come without warning.

It is entirely satisfactory to ask the question directly, as "How can you be kind without being easy?" or "How do you make your students work?" The first response is likely to be negative or non-committal, as "I can't tell you how I do it," or "I have never thought about that," or, "It just comes naturally to me." Then the interviewer should usually say nothing and wait; the subject then feels that he has to say something and so begins to talk. As he talks he tells what he does. He may use incidents or give rules or state his own opinions. But the important thing is to get him to talk freely.

Three rules may be used in directing this catch-as-catch-can conversation. First, ask the question "How do you do that?" at every opportunity. The interviewer wants methods. So when the subject says "I do so and so," the interviewer immediately rejoins "Just how do you do that?" The subject will not descend to details unless he is forced to do so, probably because he feels that, since the method is clear to him, it is self-evident to everybody; nor does he yield details easily, because often he may never have attempted to analyze his methods before. Constant repetition of the query *How* is absolutely essential.

Another important request is "Give me an illustration of that." Often the method is revealed more easily by a story than by a tabular exposition. Whether this is the case or not, the illustrations make good reading in the final compilation.

Interviewers must also cultivate the habit of recording what the subject says in the words of the subject. He should take no liberties with the terminology, particularly where the expression is vivid or apt. It is, of course, impossible to quote the subject verbatim, but striking phrases and clever terms must be retained. An excellent interviewer is one whose reports have each an individual style which mirrors the individuality of the subject. Deletion may safely be left to the compiler.

The interviewer must make the subject return to the point when he is wandering far afield. No specific rules can be laid down for this; but no offence is given if the interviewer is tactful, kind, and interested. Such phrases as "I was quite interested in what you said a moment ago about so and so," or "You were about to tell me," etc. A firm but tactful interviewer can complete the conference in much less time than a self-conscious and timid interviewer. But it is much better to err on the side of tolerance than of brusqueness. If both parties are having a good time no offence will be given when the interviewer guides the subject back to the point. The more fun and friendliness one can get into the interview the better.

While the conversation is going on the interviewer gives no offence by writing steadily. He has his note book handy and at

an early point in the interview he may say, "Wait—I want to get that down." This naturally pleases the subject, who continues to talk with more animation, because of the evident importance of what he is saying. I have had a subject try to help me by attempting to re-state his own vivid account in the platitudinous epigrammatic form he had read in books on salesmanship.

The interviewer must not be encumbered by too many subordinate questions worked out in advance. If he is to get information upon specific minor points he may do so. But the success of an interview lies in the persistence of the interviewer in boring in with questions to get methods and in the informality of the conversation. If he has a stereotyped method of attack and does not follow the current of the conversation, the subject will not talk freely.

The interest of the subject, when proper contacts have been made, can always be counted upon, so far as our experience goes. We feared that the salespeople would look upon their methods as trade secrets by which they had achieved success and would not wish to reveal them. But on no occasion has any subject been unwilling to talk freely in our interviews, although we have interviewed over five hundred persons this year. Sometimes if the interviewer arrived at a very busy moment the subject may have been hurried, but was never discourteous. The reason is that all men love to be questioned by an interested listener about the things which they know best.

Certain limits as to time and the number of questions have been observed. Though our longest interview was five hours, at the end of which time the subject, a college professor, was still going strong and the interviewer, a young instructor, was a physical wreck—the average length of interview with the professors was an hour and a half. With the salespeople the interviews last for an average of forty-five minutes. The length must be pitched to the interest and endurance of the subject. If it is too long the last questions will be hurriedly answered. Indeed, we have found it advisable to have the interviewers change the order of the questions to obviate this difficulty. Likewise,

we have had to caution them to speed up the interview upon the early questions in order to leave sufficient time for discussion of the later ones.

When more than seven questions are included in an interview there must be a good reason for the extra number. Occasionally more have been asked by us but careful inquiry from the interviewers has led us to place seven as a reasonable number for one interview.

We have demonstrated to our own satisfaction that the interview is superior to the written questionnaire. On one occasion we had sixty subjects write answers to seven questions and later we interviewed them. The written replies brought us fifteen methods of handling the seven questions. The interviews, however, extracted eleven methods in answer to one question and forty-seven for the seven questions.

The explanation of this lies in two facts. First, subjects as a rule do not write as freely as they talk, and will not willingly write anything more than the minimum. In the second place, they write their philosophy of life or some other vague generalities and will not get down to specific details. When they talk to an interviewer he can bore into the realm of their rich experience by asking "How?" and "For instance—"; but when they write there is no recourse. Their statements cannot be easily supplemented.

On two occasions recently we have had recourse to written reports. In one case two hundred teachers of Pittsburgh were asked to state how they taught courtesy. To obtain details they were asked to write at least five hundred words, and this device gave that volume which is conducive to the statement of detail. In this case it was impossible to interview any large numbers, and the results were valuable but the labor for the compiler was huge. Not over thirty percent of the material was to the point, and I am of the opinion that if we had had five interviews with subjects in each grade, or a total of forty, we would have obtained better results. On the other occasion we divided sixty-seven questions concerning the difficulties of Sunday School teaching

among twelve hundred picked Sunday School teachers in the northern states with the purpose of having each answered by one hundred and twenty teachers. In this case we took elaborate care to simplify the work and particularly in the directions gave an example of how to answer one question incorrectly as well as correctly. This device proved to be very useful and the results were unusually good for the written questionnaire. It may be stated parenthetically, however, that in asking 120 teachers to answer each question we hoped to obtain thirty answers. In other words we hoped to obtain returns from twenty-five percent and as a matter of record we received twenty percent.

This leads to the question of the minimum number of subjects to interview on any question. Upon this we have definite figures. Our maximum number of interviews on any question is 117, excluding the two written questionnaires. Our minimum number was thirty. In the handling of salespeople we averaged 77 on each question. This study consisted of twenty-three questions and the total number of specifics obtained was 136. Of these 136, ninety-seven percent were obtained in the first thirty answers to each question.

The only advantages that accrue from more than thirty interviews are the addition of this small percentage of specifics and the variety of expression and illustration which may often add force to the compilation, especially when it is directed to a semi-popular audience. We have ceased trying to obtain more than fifty reports on a question and are reasonably well satisfied if we obtain thirty.

The Report

As soon as the interviewer has completed his interview, or not later than the same evening, the interviewer is expected to write up his report before the details have evaporated. It takes about as long to write the report as to hold the interview. So in the assignment of interviews we have adopted the plan of allowing about three hours for each interview and report, which is a minimum, after considering the amount of time spent in arranging and waiting for the interview. It has already been

stated that the report must contain sufficient details to be used by another person. All irrelevant material must be excluded. Preferably the specifics given should be numbered, both for ease of compilation and for clarity of description; but this cannot always be rigidly adhered to without the loss of the vividness of a subject's description.

On the mechanical side the observance of a number of details helps in the final compilation. We have followed the plan of writing the reports on paper of uniform size.

Certain facts are useful to the compiler. The interpretation of the report may be clarified by knowing who gave it and the angle from which it was given. The interviewer's name serves as a check; and the time consumed is useful for time studies. A code number is placed on the report for each question and refers us to the first page. Each question is answered upon one or more separate sheets of paper so that they can be distributed later. The sheets for one interview are clipped together and handed in.

It is important with amateur interviewers for the compiler to read the reports to them as they come in so that he can train them to improve upon their interviews or reports. To demonstrate to an interviewer that his report reveals little or nothing of method is salutary. He may defend himself by saying that he could get nothing from the subject; and although this is occasionally true, he is placed upon the defensive and is in proper condition to accept coaching from the compiler. Some of the interviewers soon need no checking and others have to be dismissed.

The Compilation

When the required number of reports have been obtained they are naturally separated and the thirty or forty answers to each question are brought together. I have found the following method of compiling the least burdensome.

I place the reports on one question before me and as I read I notice each specific. For instance, in the seventy-seven reports upon the question, "How do you secure the confidence of your salespeople?" I find the following methods:

I. Raise salaries as soon as deserved
II. Give opportunity for a fair hearing
III. Keep promises
IV. Assist them to better themselves
V. Treat them with respect
VI. Give praise fully when it is deserved

These were obtained by reading the reports. When the first report was read Numbers I and II were found and jotted down on a finding list; in the second report Numbers I and III were found; and Number III was added to the other two on the finding list. In each report the Roman number which stands for the classification is placed in the left hand marginal space and lines drawn to indicate where it begins and ends. All irrelevant material is crossed out. A stenographer then takes the reports and copies all the statements with the Roman numeral attached, in a running account without regard to order. These are then cut and collected so that when the report comes to the compiler's desk he has all the methods reported in answer to the major question classified and arranged.

From this point on the organization of the material is determined by the form of the final material which the compiler desires. It becomes his business to provide the connective tissue and throw it into final form. The interesting problems of organization and interpretation of arrangement around central principles in syllabus or expository form cannot be discussed here.

In conclusion, a few qualifying remarks should be made about the method. In the first place, specifics so collected are not evaluated. Some may be good and some bad. It may be said, however, that when experts only are interviewed the probability of usefulness is high, and in any case the methods are offered as a variety of suggestions rather than as a collection of scientifically evaluated methods. Moreover, I know of no basis of equal value for a long campaign of evaluation. Nothing is more favorable for such a purpose than this varied and voluminous body of specifics, which may be tried out under controlled conditions and given their proper value. Such methods do not

supersede scientifically evaluated methods, but they fill a gap in which there are no recorded methods.

Neither can we assert that these reports minutely describe actual practice. One subject phrased it excellently when he asked, "Do you want to know what I do or what I ought to do?" But if a body of experts will tell us what they ought to do, their wisdom is more suggestive than is a description of what they actually do when they are tired or hurried. Their best judgment about the best thing to do is very close to maximum excellence.

If so much time had not already been consumed I should be glad to discuss other limitations of the method and the results, because many of them are quite apparent to me; but my main purpose has been to describe this method in some detail.

On the positive side it is entirely clear to me that trained interviewers can be utilized today in any fairly large school system to collect from the teachers a more voluminous, a more suggestive, and a more practical body of specifics used in the control of any difficulty than is found in print, and with the exception of recorded methods which have been scientifically derived and evaluated, they are likely to be superior. Any such school system has enough methods going to waste, so far as their general use is concerned, to provide the teaching force with all the methods needed to run the schools with maximum efficiency.

The method need not be confined in the schools to the collecting of specifics for teaching difficulties. Job analyses of the supervisors' duties, as well as of those of the principal, the city superintendent, the county superintendent, the vocational adviser, and the janitor can be made, and by widening the scope of the survey equally valuable masses of specifics can be collected and compiled. But the interviewers must be trained, the task must be seriously and skillfully performed, and the necessary patience and assistance assured.

Selected

THE RELATIVE PROGRESS OF VII-B GROUPS SECTIONED ON THE BASIS OF ABILITY

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This report gives some achievements of different VII-B ability groups in the Cleveland schools. These pupils had been given the Illinois intelligence test as VI-A's early in January, 1920. The results were utilized by the junior high school principals in arranging them into VII-B groups of different ability as they entered the junior high school on January 31st. In some cases weight was given to previous school records. Administrative necessities entered to some extent.

In presenting the results, we are not unmindful of the fact that success in school work depends not only upon intelligence but upon several other factors, among them being general maturity, previous scholarship, effort, home environment, attendance and health, the quality of teaching, and the course of study. Naturally, a pupil who is highly favored in each of these respects will advance more rapidly than one who is unfortunate in each.

At the end of the semester in June, an effort was made to determine some of the achievements of the different sections in each school. The pupils were tested with the Stone Reasoning test in arithmetic; the Monroe Reading Test, Form II; and the Charters Language Test. Statements of the quality of work done by the different sections were obtained from the teachers.

Standard Test Results

After the results of the tests had been tabulated by classes, the records were arranged according to the class intelligence score. All classes with an intelligence score of 82 and up were placed in Group I, between 72 and 82 in Group II, between 67 and 72 in Group III, between 62 and 67 in Group IV, between 52 and 62 in Group V, and below 52 in Group VI. The number of classes in the different groups ranged from nine to fifteen.

The score made by the median class in each test and in each group was next determined. This record appears in Table I. In arithmetic, the median class in the lowest intelligence group

TABLE I.—MEDIAN CLASS SCORES BY INTELLIGENCE GROUPS

Illinois Intelligence Test Score	Median Intelligence Score	Median Age	Stone Arithmetic	Monroe Reading		Charters Language
				Comprehension	Rate	
82 & up	86	12.7	7.0 (12)*	32.3 (11)	133 (10)	21.1 (12)
72–82	75	12.8	6.6 (13)	26.8 (13)	133 (10)	18.8 (12)
67–72	69	13.1	6.1 (9)	23.8 (8)	133 (7)	16.7 (8)
62–67	65	13.2	5.1 (15)	23.6 (12)	115 (9)	15.8 (12)
52–62	56	13.3	5.1 (15)	21.5 (12)	115 (8)	14.0 (14)
Below 52	48	13.7	4.6 (10)	18.0 (9)	101 (8)	13.8 (10)

*Figures in parentheses indicate number of classes represented.

scored 4.6 while the median class in the brightest group scored 7.0, a *difference equivalent approximately to one and one half year's progress.* In reading, the median class of the lowest intelligence group scored 18.0 in comprehension and 101 in rate in contrast to 32.3 and 133 respectively for the median class of the brightest group of classes, a *difference equivalent to more than two years of work.* In language, the scores made by the median classes were 13.8 for the lowest and 21.1 for the brightest intelligence group, a difference again equivalent to more than two years of progress. Thus we see that the average class of highest intelligence was in no case less than three semesters ahead of the average class in the lowest intelligence group.

Space does not permit us to show the individual record of each class in each of the fourteen schools. As a rule, the sections that made higher intelligence test scores in each school excelled in scholarship. In the arithmetic test, 22 of the best 37 classes and only 7 of the poorest 37 made a score of 6.0 or better. In reading comprehension, 65 classes were tested. Among the best 32, there were 22, and among the poorest 33, there were 4 that equalled or exceeded Monroe's comprehension standard of 26. Out of the 34 best classes tested in language, there were 25 that scored 18.0 or better, while out of the poorest 34, there were

only 5 that scored 18.0 or higher. The classes that made a score of 6.0 or better in arithmetic were three times as frequent in the better half as they were in the poorer half. Those that made a score of 26 or better in reading were five and one half times as frequent, and those that scored 18.0 or higher in language were five times as frequent as in the poorer half.

The brighter sections were generally made up of younger children. The typical class among the brighter half of the classes was slightly more than half a year younger than the typical class of the poorer half. The age of the former was 12.8 years and of the latter 13.4 years. The classes in the group having an intelligence score above 82 were one year younger than those in the group with a score below 52. The age of the "82 and up" classes, as may be seen in Table I, was 12.7 and that of the "below 52" classes was 13.7. The former were not only mentally more mature as shown by their higher intelligence score, but possessed a higher intelligence quotient as may be seen by comparing the ratios of their ages and intelligence score. The intelligence score of the median class in the former was 86 and its age was 12.7 years while the latter had an intelligence score of 48 with an average age of 13.7 years.

To determine just how closely the results paralleled intelligence for individual pupils, the records of 200 pupils, selected at random, were correlated with intelligence by employing a formula (Pearson) commonly used in statistics. The results in every case were positive. The highest correlation between intelligence and any of the school subjects was found in arithmetic. Reading (comprehension) ranked second, and language third. The figures were .50, .44, and .37 respectively where 1.00 represents perfect correlation. For pupils of the same school grades, these figures are considered as representing a fair degree of correlation. It is altogether likely that the correlation between intelligence and results would be materially higher if the results of several intelligence tests, rather than a single test, had been used. When we reach the point where the schools succeed in getting out of every pupil all that they should, in view of his

intelligence, and when we are absolutely certain that we have measured his intelligence correctly, we may expect these figures to go much higher.

Grouping by intelligence or mental maturity does not eliminate the necessity of good teaching to bring out the best results. *Equal or approximately equal intelligence does not mean equal scholarship.* While the results in different sections of the same school correlated fairly closely with intelligence scores, two facts stand out quite prominently. (1) There was a marked difference between classes of the same intelligence. (2) Some low intelligence classes did better than others of high intelligence. How great the difference between the best and poorest classes in each intelligence group and subject were may be seen from Tables II-IV.

TABLE II.—THE BEST AND THE POOREST CLASS SCORES IN THE STONE ARITHMETIC TEST FOR EACH INTELLIGENCE GROUP

Intelligence Group	82 up		72–82		67–72		62–67		52–62		Below 52	
	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest
Intelligence Score	99 88	82.4	78.4	75.8	70	68	62	64.5	59.8	56.3	44.5	42.5
Arithmetic Score	8.0*	5.1	8.6	4.9	6.9	4.6	7.3	4.0	6.3	3.1	6.1	3.0
Median Arithmetic Score of Group	7.0		6.6		6.1		5.1		5.1		4.6	

*Two classes in the highest intelligence group made equal scores

In the Stone Arithmetic Test, 1.5 points represents approximately one year's growth. The average difference between the best and poorest classes in each intelligence group is slightly more than 3.0, or approximately *the equivalent of two years of progress.* The differences in the Charters Language Test where a difference of 3.0 points represents somewhat more than one year's growth were equally pronounced. In reading comprehension, the best class in every intelligence group, save the low-

est, scored above Monroe's eighth grade comprehension standard of 28.2. The poorest class in all but the two brightest groups fell below his sixth grade standard of 18.1. When such variations are found between classes supposedly differing very little in intelligence, the cause of the difference must be sought in

TABLE III.—THE BEST AND POOREST CLASS SCORES IN THE CHARTERS LANGUAGE TEST FOR EACH INTELLIGENCE GROUP

Intelligence Group	82 up		72–82		67–72		62–67		52–62		Below 52	
	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest
Intelligence Score	82.4	84.5	79.5	73.6	70.8	68.5	65.8	62.5	56.3	55.5	48.3	48.8
Language Score	26.7	17.8	23.0	13.8	21.8	15.0	22.8	10.5	20.2	9.0	19.7	9.5
Median Language Score of Group	21.1		18.8		16.7		15.8		14.0		13.8	

something other than intelligence. The differences are undoubtedly due in the main to differences in educational environment, the chief factor in which is teaching.

In passing it should be observed that foreign parentage and the consequent language handicaps may have entered into the

TABLE IV.—THE BEST AND THE POOREST CLASS SCORES IN MONROE READING COMPREHENSION FOR EACH INTELLIGENCE GROUP

Intelligence Group	82 up		72–82		67–72		62–67		52–62		Below 52	
	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest	Best	Poorest
Intelligence Score	85.5	88.0	76.5	78.3	70.8	68.5	65.8	63.0	56.3	54.0	50.9	44.5
Reading Score	37.0	28.3	32.1	20.8	29.0	17.5	32.8	16.0	30.0	15.0	22.5	13.6
Median Reading Score of Group	32.3		26.8		23.8		23.6		21.5		18.0	

results of our tests to some extent. In one school, for example, only 23 percent, and in another, 26 percent of the pupils were of native white parentage, as against 63 percent and 62 percent in two other schools.

A distinct need, brought out by the disparity of results among classes of approximately the same level of intelligence and by the superior achievements of some of the classes of lower intelligence over those of much better intelligence, is that of closer supervision of the teaching product. One may well ask whether teachers are making good use of the pupils' time and of their own when such inferior results as those of the poorer classes are obtained. It is clear that some classes are not securing the results they should, in view of their natural gifts. The fact that the best class in the lowest intelligence group in arithmetic and language exceeded the record of the poorest class in the highest group shows that it is possible even without unusual effort to reach a much higher standard than that attained by the poorer classes in every group. Much improvement could, undoubtedly, be brought about through helpful supervision. We have already invested our money to the extent of providing buildings, equipment and teachers, and in return secure some such results as those indicated in the preceding tables. Would it not, therefore, be a good investment to spend a few additional dollars to train these teachers to make accurate diagnoses of results, to select the most appropriate materials and methods and to develop adequate skill in their application? If our statement of the principal cause of difference between classes of the same intelligence is at all accurate, namely, a difference in the quality of the teaching, then most assuredly it would.

If classes of given intelligence levels are to work to their own best advantage, there must eventually be courses of study suited to the abilities of different groups. Brighter groups may be expected to delve deeper into a subject while more extensive eliminations of non-essential subject matter are made for the lower groups. Thus far, comparatively little, so far as we know, has been accomplished in this particular direction. It is to be hoped

that differentiated courses of this nature will be developed within the next few years. Possibly the day may come when we shall have text books addressed to children of given degrees of intelligence. Instead of continuing to bend the child to the course of study and the text book, we must reverse the process.

Another important suggestion arising from the results is the need of achievement standards for classes of different intelligence levels. So long as we have one standard for all children of a grade, we are apt to expect what is next to impossible from one group of children and what may be had with the barest semblance of effort from another. Moreover, the teacher of the low intelligence group will probably be regarded as a failure while the teacher of the bright group will be heralded as a success.

However, as present standards go, we need have little fear for the low intelligence groups, so long as they have good teaching. The standards of most tests are probably within the reach of all but the near-feeble-minded or definitely defective children. It is high time that we were getting beyond standards based upon average performance, and presumably average intelligence. To continue to accept them is to be content with mediocrity. Standards should represent the results which good teaching can accomplish with a given grade of intelligence and mental maturity. In this connection, we may question whether the recent attempts to set up accomplishment or achievement quotients[1] are not likely to mislead, however praiseworthy these efforts are. By the methods proposed by Buckingham and Monroe and by Franzen,[2] the achievement of a child who does as well as the average of children for his age and intelligence is regarded as 100 percent achievement or 1.00, that is, normal. While they recognize of course that many children can accomplish more, they wish us to subscribe to a policy of calling the product of a variety of conditions good, bad, and indifferent, 100 percent attainment. To do this is conducive to mediocrity, for it requires only mediocre

[1] Buckingham, B. R., and Monroe, W. S., *Illinois Intelligence Examination, Teachers Handbook.*

[2] Franzen, R. H., The Accomplishment Quotient, *Teachers College Record*, 21:432-40, November, 1920.

teaching and the same quality of effort, with fair attendance on the part of pupils, to achieve such standards. What will be the effect of allowing teachers and pupils to feel that their accomplishment represents 100 percent when, as a matter of fact, they could easily do more? The scores made by the best classes in Tables II, III, and IV were not obtained under conditions that were at all unreasonable. They were not even so unusual as to attract the attention of the supervisory staff. Yet by the methods proposed these children would, undoubtedly, be regarded as having achieved considerably more than 100 percent. It would be far better to regard the achievement of the best classes of any intelligence level as 100 percent attainment, but even that would not be satisfactory. When our science of measurement advances to the point where it will enable us to measure the capacity of children of given intelligence levels for learning specific subjects, such as arithmetic or reading, it is possible we shall want to regard achievement in terms of *capacity to achieve*. Few children would ever attain 100 percent achievement, but we would know how far the child had progressed in the direction of his possibility to achieve.

Statements of Teachers

Statements of teachers, as may be seen below, indicate almost uniformly that the stronger sections were able to do either a much higher quality of work or more work than the weaker sections. Pupils were enabled to work with others capable of going at about the same pace. Dull children were not carried beyond their depth, nor bright children permitted to loiter.

Typical Comments on the Work of Different Sections

1. Mathematics. "In these sections (Slow), we omit the more difficult part of the assignment, and give the work more slowly. We take more time for explanation, give more drill work, board work and much oral concrete work. We give much attention to analysis. We find in the more advanced classes the pupils have more initiative and can work more independently."

Better Sections	Slower Sections
2. English.	
(1) "Cover assignment easily and contribute more to each recitation."	(1) "Cover only a minimum assignment, and contribute very little."
(2) "Enjoy work and like to solve problems."	(2) "Enjoy only the simplest types of work."
(3) "Have deeper appreciation; can handle more difficult selections."	(3) "Meager appreciation; must have only the simplest selections."
(4) "Have time for and enjoyment of dramatics."	(4) "Time insufficient and ability lacking for dramatics."
(5) "Content (of composition) is richer, form only average."	(5) "Content mediocre, form often good."

3. Art. "The same work can be given Groups IV and V (slow sections). They require continual supervision. In the Groups I and II (bright sections) directions are carried out without supervision." .....Cooking. "It is necsesary to repeat work until it becomes automatic in the V's while the I's and II's advance more rapidly.

4. Mathematics. "While we have attempted to give our VII-B's in mathematics the same general assignment, the *quality and quantity of work* done in our I and II divisions (strong) is vastly superior to that done in the V division (slow), care having been exercised to make the daily assignments suited to the ability and intelligence of respective classes.

5. Music. "As a rule the children who do the best work in other subjects do the best work in music. Especially is this true in part singing. The slow pupils can sing a one part song equally as well as the brighter ones, but in a two or three part song, it is difficult for the separate groups to carry their parts."

6. History. "Since Group I met only four times a week it was impossible to go more fully into the work than in the III and IV (weak) divisions." . . . "In Group II the assignment was covered more fully than in the other sections. It was possible to spend more time on the study of the colonies (and to study more colonies) and on the great characters of the colonial period. More supplementary reading was possible . . ." "In Group V the assignment was not covered as fully as in the other sections."

7. Geography. "The qualities (initiative, originality, leadership, power of concentration, ability to apply geographical principles, and interest in subject matter) are present more uniformly in sections I and II than in sections III, IV, V, and VI."

"The following assignment was given to sections I and II:—

Locate in plateau regions various industries. Establish hydro-electric power plants. Select sites for irrigation projects, also for sanatorium resorts. Give reason for choice of location of industry in that region. (Here follows a list of the industries selected by the children. "With the aid of maps and references, each pupil went to work with a will and keen desire to prove the claim to the 'financial aid' which the teacher promised to extend if the industry could be put on a paying basis. In sections IV, V, and VI, the method of procedure was very different. The class read from the text book and supplementary material, constant reference was made to wall maps with questions by teacher and pupils. This was necessary to hold the pupils' interest and keep them 'on the job.' In divisions I and II, the teacher's work is in the background, while in the others the teacher must supply more leadership and initiative."

8. English. In composition, the VII-B_2 Section III (strong) prepared more difficult topics and worked with fewer notes, with emphasis on presentation as well as the subject matter." . . . In literature, "the III class discussed less obvious points in the stories, looked up allusions, etc." . . . In grammar, "Group VI covered the essentials, chiefly, such as subjects, predicates, and parts of speech. Group III went into the modifiers, (adjectives, adverbs, etc.), used more difficult sentences and more involved examples."

Conclusions

The results afford sufficient justification for the policy of grouping pupils on the basis of ability. However, in the future it will probably prove advisable to take into account in addition to intelligence, previous scholarship, standard educational test records, and any other unusual conditions.

The next problem will be to take adequate care of the different groups. Whenever the pupils of a bright group are physically and socially mature enough, they should be permitted to pass through the school system in less time. In a city like Cleveland, each class of 25 that can be made to cover the work of the three-year junior high school period in five semesters will result in a saving to the district of not less than $1500. One such class annually in each of its 17 junior high schools would effect a yearly saving of $25,500, to say nothing of the additional classroom space made available.

For the groups that will not skip, varied courses of study need to be provided. The better-than-average classes need an enriched content, while the classes of lower-than-average ability need a minimum essentials course.

Achievement standards for groups of various intelligence levels are needed. These should be based upon the possible attainments of well-taught children of given degrees of intelligence and mental maturity. Present standards are far too low, especially for brighter groups of children. Pupils should be brought to the point where their rates and amounts of learning accord approximately with their intelligence.

The situation could be improved by means of a greater amount of helpful supervision. This is probably one of the most important tasks confronting principals. Since principals cannot often give the necessary attention to the detailed analysis of results that is required, it will probably prove economical to designate some one person in each building to devote a portion of his time to assisting the principal for this purpose. Such an individual could assume responsibility for retesting pupils from time to time, so that more dependable measures of each child's abilities might be had. He could confer with teachers regarding classes or individuals whose ability and school work were not in accord and could assist the teacher in finding the necessary remedies. By so doing, many pupils would, undoubtedly, be saved from failure, thereby resulting in saving the school district additional sums. A comparatively small number of pupils prevented from failing would much more than pay for the cost of the portion of the person's time devoted to this type of work. Not only should such an assistant serve to prevent many failures but should bring about improvement in the quality of instruction.

THE "LIST" VERSUS THE "SENTENCE" METHOD OF TEACHING SPELLING

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This study has been made in an attempt to determine the relative superiority of the list method and the context method of teaching spelling. In order to make the results as true to actual conditions as possible, the study was carried on with as little modification of normal procedure in the class room as practicable.

The study was made in two Rochester, New York, schools, Seward School Number 19 and Francis Parker School Number 23. The children of both schools are from good English-speaking homes. Exactly 1100 pupils taught by thirty-two teachers were used for the experiment. The grades ranged from the third to the eighth, inclusive, and the ages of the children from seven to fifteen.

The Method

The regular text for each grade was selected because it was found to furnish a sufficient amount of suitable material for the test, and because it would permit the regular program of the school to progress under as nearly normal conditions as possible.

The organization of both schools was combined and to each grade the particular method of teaching to be followed was assigned. For example, Grade VIII-A in School Number 23 used the context method, while Grade VIII-A of Number 19 used the list method. Grades VIII-B and another class of Grade VIII-A in School Number 23 used the list method, Grade VIII-B in School Number 19 used the context method, etc., down through the entire list. This, as will be seen, gave a variety of methods in each grade.

The experiment lasted over a period of thirty lessons and at the end of each ten lessons a test was given. To determine the initial spelling ability of the children a test of twenty-five words was given in each grade at the beginning of the experiment.

except in the third grade where ten words were used. This first series of tests was prepared by the principals of the two schools concerned, a separate test being made for each grade. The words were selected from the regular spelling list to be learned during the year. This test was first presented in context form, the teacher giving the test words in sentences and the children writing the complete sentences as dictated. No emphasis was given to the test words in these sentences. Then the words to be tested were pronounced in list and written on another paper.

The first test was designed to determine roughly the initial spelling ability of each child. The second and third lists were prepared from words in the ten preceding lessons and presented in the same manner as the first, except that their purpose was to test the degree of attention that had been developed by each method of instruction during the past ten lessons. The second and third tests were prepared for each section of each grade. The fourth test resembled the second and third except that its range comprised all the list taught during the thirty lessons. This test was designed to determine whether or not better word imagery of a lasting character was secured by the one method of instruction than by the other.

For the purpose of this experiment the time expended in spelling instruction by either method was the regular amount allowed by the Rochester schedule of fifteen minutes per day in all grades except the third where twenty minutes were allowed. By fifteen minutes to spelling instruction is meant that from the time the lesson began until the papers were finished by the children only fifteen minutes were to be used.

The method suggested for general use in teaching spelling was the Pearson method with such modifications as seemed best adapted to contextual or list instruction.

The experiment was begun fairly early in the semester. In order to have words that had not been taught, a portion of the text toward the end of the assignment for the term was selected for each grade. The teachers were instructed concerning the time allotment and method, and advised not to progress under

any circumstances faster than an arbitrarily determined rate of six new words per day.

One group of teachers tested each day's results by having the words written in lists and an equal group tested results by having the words written in sentences.

Tables I, II, and III show the results. It will be seen that according to Table I the children of the third grade who were to be taught by the list method numbered 81, and that they averaged 77.7 percent when tested the first time by the list method and 69.2 percent when tested by the sentence method on the same words none of which had previously been studied. At the same time 56 third-grade pupils, who were to be taught by the context method, earned 62.3 percent on the list test and 55 percent on the sentence test.

In all cases children are shown to spell better in list than in sentences. This is no more true of those who were taught by list than of those who were taught each day to write the words in sentences. In the final test the third-grade pupils who had been taught to spell in lists earned 2.2 percent less on the "sentence test" than on the "list test"; while the corresponding loss of those who had been writing sentences daily was 4.7 percent. In the fifth and sixth grades (Table II), those who were taught by the list method lost 3.1 percent when their sentence spelling is compared with their list spelling; while the pupils of the same grades who were taught to spell in sentences lost 1.0 percent.

In Grades IV to VIII inclusive the loss of the "list taught" spellers was 1.3 percent and those taught in sentences likewise

TABLE I.—RESULTS OF TEACHING WORDS BY THE LIST AND CONTEXT METHODS. THIRD GRADE

	Test I		Test IV	
	List form	Context form	List form	Context form
Taught by List				
Number of pupils	81	81	82	87
Percent correct	77.7	69.2	88.7	86.5
Taught by context				
Number of pupils	56	56	57	57
Percent correct	62.3	55.0	88.1	83.4

TABLE II.—RESULTS OF TEACHING WORDS BY LIST AND CONTEXT METHODS. FIFTH AND SIXTH GRADES

	Test I		Test IV	
	List form	Context form	List form	Context form
Taught by list				
Number of pupils	202	201	203	205
Percent correct	59.6	55.6	89.9	86.8
Taught by context				
Number of pupils	165	166	171	171
Percent correct	63.5	59.2	89.8	88.8

TABLE III.—RESULTS OF TEACHING WORDS BY THE LIST AND CONTEXT METHODS. FOURTH TO EIGHTH GRADES INCLUSIVE

	Test I		Test IV	
	List form	Context form	List form	Context form
Taught by list				
Number of pupils	412	412	418	420
Percent correct	68.4	65.	90.5	89.2
Taught by context				
Number of pupils	458	457	456	456
Percent correct	70.8	65.8	89.7	88.4

lost 1.3 percent. *It appears then to be true that in general the loss in spelling ability which results when pupils write in context cannot be prevented any more effectively by using a sentence method than it can by using the list method.* By comparing results of the first set of tests with those of the fourth test it is seen that the loss in context spelling over list spelling is greater in the case of unfamiliar words than it is in case of familiar words.

Conclusions

The chief conclusion to be drawn from the above tabulations is that there is no advantage in having children write their spelling words in sentences. Pupils using the list method did better than those using the sentence method. In Grades IV to VIII, the 458 pupils who were to be taught by the sentence method were shown to be slightly better spellers at the beginning of the experiment than were the 412 pupils who were to be taught by the list method. At the end of the teaching period, however,

the list-taught pupils made slightly the better scores. In the third grades, the list-taught pupils started with a very decided advantage and ended with a reduced but a very distinct advantage. In the fourth grade, list-taught pupils started and ended with distinct advantages over the sentence-taught pupils. In the fifth and sixth grades the list-taught pupils started with a distinct disadvantage and ended with a slight disadvantage. In the seventh and eighth grades there appears to be little advantage to either group.

It is evident then that if teachers are to have words written into sentences they must see values in that procedure, other than spelling values. If teachers wish to test pupils on the new words of the week, as is advocated by the best authorities, and if they desire to have the spelling work reviewed within the alloted spelling time, they will use the list method. That they will be justified in so doing is suggested by the results of this experiment.

AN AID TO THE ANALYSIS OF VOCATIONAL INTERESTS

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Three year's trial has demonstrated the service of a blank for training pupils to analyze their work interests. Pupils are often left to flounder under the injunction: "Think what vocation you desire to enter." The blank to be described was developed to meet this situation. It was first tried out with 8,500 pupils in all the Pittsburgh high schools, where it was given as a group exercise in all the forenoon classes. The vitality of the method is attested by the fact that four of the larger schools continued to use it with all new pupils. The method was informally mentioned at the meeting of the National Vocational Guidance Association in 1920. Numerous inquiries followed and several school systems, notably those of Erie, Pennsylvania, and Seattle, Washington, have used the plan. The Y. M. C. A. and other organizations offering vocational guidance in New York and Chicago have also utilized portions or all of the blank. A summary of the 1918 results in Pittsburgh with an exposition of its main feature is here presented to encourage further trial of the method.

The plan differs from other self-analysis blanks in being devoted entirely to the problem of relating the vocational choice to fundamental personal interests. Moreover, the purpose was to show a young person of high-school ability *how* to observe his aptitudes, *how* to discover his special vocational tendencies, and *how* to think about his work interests. It is a blank for training in observation of personal interests so that from a mass of vague impulses the special vocational direction may become better defined. The objection that such analysis is too difficult for high-school pupils was definitely settled by the Pittsburgh experiment. The blanks were filled out by all classes in each school during the forenoon recitation periods, without consulta-

tion or discussion and without leaving the room. This plan of filling out the blank is not advocated as generally wise, but it was used this first time to determine whether the blank could be answered by all classes in high school. It was found that four out of five answered the complete blank so adequately that the data could be compiled. For none was it too difficult to attempt. Instead of giving the blank as a group exercise, several schools now ask the pupil to take it home and talk it over with his parents. In this way the parents also become interested. In either case the blank becomes the basis for individual interviews with vocational counselors.

The blank consists of ten parts printed as a folded sheet of four letter-size pages. Samples may be obtained from the writer upon request. For the purposes of the present paper certain features will be described in detail. The subdivisions consist of: (1) record of occupation of the father and of other relatives or friends whose work has interested the pupil; (2) the occupations in which the pupil has worked, with the features liked and disliked; (3) a list of subjects studied to be checked for those preferred; (4) a list of paired contrasting work conditions to be checked for those which appeal; (5) a list of desirable personal traits to be marked by the pupil for those strong and weak in himself; (6) a request for information about things done *outside of school* which might disclose work interests; (7) a new classification of kinds of occupational activities among which the pupil indicates his first three preferences; (8) a record of how the pupil expects to start when he begins work; (9) an opportunity at the close for the pupil to summarize his ideas about his vocational choice and to assemble the reasons for believing that the vocation best meets his own interests; (10) a record to indicate what people helped by advice to direct the pupil's choice and the kind of advice received.

Classification of Occupational Activities

Two new features of the method may be emphasized, namely, the classification of kinds of work activities and the paired con-

trasts of work conditions. Any attempt at occupational classification is most difficult when one considers that some 17,000 occupational designations are listed in the federal index of occupations. The census classification, which is most frequently used, is hardly serviceable in training the pupil to approach the problem by observation of his own experiences. It starts with the following broad groups: agriculture, forestry, and animal husbandry; extraction of minerals; manufacturing and mechanical industries; transportation; trade; public service; professional service; domestic and personal service; clerical occupations. These are suggestive but fail to reach various distinctions in types of vocational interests found among high-school pupils. Neither do the usual classifications of vocational ambitions of high-school pupils reach what seems to the writer to be more fundamental work habits and interests which allow opportunity for special aptitudes and give promise of the most permanent satisfactions in a life work. It may be added that when the Personal Branch of the General Staff of the United States Army attempted to work out a classification index of trades needed in the army it was found useful in practice to bring together those occupations using similar habits and working with similar tools.

The classification which we tried was a venturesome attempt to get away from the industrial framework to the kind of skill required. Furthermore it was the satisfaction of the pupil's special interests which he was urged to seek. He was asked for example, whether he liked to operate machines, to do work requiring delicate muscular movements, to influence people by direct or by indirect appeals, to make and systematize records, to do scientific work, etc. Each field of interest was followed by illustrations. An occupation might require several kinds of activities but the pupil was led to indicate the three major interests, which he wished to consider further.

The full statement of this part of the work appears below with the proportion, in a thousand choices of the Pittsburgh pupils, choosing each group. The results show the distribution of first, second, and third choices combined, instead of the first

choices alone. This better represents the weight of the less common interests. The most favored groups of activities were substantially the same whether the first choices alone were considered or the combined first, second, and third choices. For example, all the six most frequent first choices among the boys and five of the six most frequent among the girls were also among the most frequent six when the first, second, and third choices were combined. The data were compiled not from the complete set of 8,500 papers but from a random sample of 1,666 papers, 582 of which were boys. Each fifth paper in each of the eleven schools including the junior and business high schools, was selected as sufficiently representative for the summary. Among these papers 347 were rejected because three occupational preferences were not indicated. Only one pupil among the 1,666 attempted to be facetious. From the nature of the replies it may be confidently claimed that the blank was answered seriously.

Classification of Interests

Under this heading the pupils were directed as follows:

> Select the three Kinds of Activities listed below at which you think you would do best and at which you think you would be contented to work permanently. Place the figure "1" before that group which you would place first for yourself. Place "2" before your second choice, and "3" before your third choice.
>
> Remember the unpleasant features of the work and the conditions under which it would be carried on. Consider also whether you have the necessary health and strength, whether you can get the necessary training, and whether this occupation will give you the opportunity to utilize your good traits and follow your interests.
>
> Any occupation will involve a number of these activities, but number only those three groups which appeal most to you. Sometimes it is well to begin by excluding those you dislike. It may help you if you will also compare yourself with others of your own age.

Results were obtained as shown in Table I, the figures indicating the proportions per thousand of combined first, second, and third choices:

TABLE I.—WORK INTERESTS AMONG THE HIGH-SCHOOL PUPILS OF PITTSBURGH

Groups of Activities	Combined first, second, and third choices per thousand	
	Boys	Girls
GROWING PLANTS, as in farming, gardening, greenhouse, etc.	65	85
CARE OF ANIMALS, as in stock raising, care of horses, etc.	46	21
OPERATING ENGINES, as locomotives, automobiles, steam plants, etc.	127	11
OPERATING MACHINES, as in manufacturing, using linotype, etc.	33	2
INSTALLING EQUIPMENT, as electrician, plumber, gas fitter, etc.	38	0
CONSTRUCTION WORK, as in building, concrete work, railroad and highway construction, engineering, etc.	113	1
DELICATE MUSCULAR MOVEMENTS, as dentist, instrument maker, woodworker, etc.	16	2
DISCOVERING AND REPAIRING DEFECTS, as jeweler, automobile repairman, telegraph repairman, etc.	51	2
TRANSPORTING ACTIVITIES, as railroad operation, express, mail, etc.	30	3
MEETING AND DIRECTING PEOPLE, as secretary, floor manager, conductor, etc.	22	53
TEACHING, as in school, shop, etc.	13	162
WELFARE WORK, as in social settlements, industrial plants, Christian Associations, churches, etc.	11	102
ADVISORY SERVICE, as physician, lawyer, consultant, banker, etc.	73	29
ORGANIZING PEOPLE, as in societies, in work gangs, in industrial and business concerns, etc.	11	14

TABLE I.—(*Continued*)

Groups of Activities	Combined first, second, and third choices per thousand	
	Boys	Girls
INFLUENCING PEOPLE DIRECTLY, as in selling, preaching, campaigning, etc.	22	15
INFLUENCING PEOPLE INDIRECTLY, as in advertising, writing, newspaper work, etc.	18	33
ORGANIZED PLANNING, as in business, in managing institutions, in developing engineering projects, etc.	57	3
SCIENTIFIC WORK, as in laboratories, in museums, in research, etc.	114	34
RECORDING AND SYSTEMATIZING RECORDS, as in office work, stenography, bookkeeping, library work, etc.	58	174
ENTERTAINING PEOPLE, as musician, actor, speaker, etc.	33	110
ARTISTIC SKILL, as in decorating, window dressing, millinery, costuming, handicraft, printing arts, etc.	17	81
ARTISTIC CREATION, as in writing, designing, composing music, etc.	16	52
Field of activity not on this list and described as follows: (*here the pupil made his own entry*)	15	11

As to the adequacy of the classification, it may be said that for the ambitions of high-school pupils the grouping proved to be surprisingly satisfactory. Difficulties occurred with certain specific occupations with sufficient frequency to indicate the advisability of a revision or at least of the addition of those particular occupations to the illustrations of the general fields. For example, *nursing* might be added to "welfare work," and *architecture* to either "artistic creation" or "construction work." *Drafting* might follow the illustration of *engineering* under "construction work." The teaching illustrations should include *music* and *expression;* and *purchasing agent* might follow *business*

under "organized planning." Ambitions such as those for the army or civil service apparently need further analysis to discover the main interests. In the army, for example, is it an interest in commanding, in organizing, or in engineering? It is not to be expected that any classification will escape ambiguity; but if the pupils are led to consider the habits of thought and action to be emphasized, an important step in the proper adjustment to a vocation will have been taken.

The writer has no quarrel with those who contend that tables of the opinions of pupils about their vocational aptitudes have little ultimate worth since the pupils are too immature to settle such questions. It is during the high-school ages, however, that such choices are planned even if they do shift in three months. *The purpose of the blank is not to gather statistical data.* In bold face type at the top of the first page of the blank under the title "Analysis of Work Interests," is the statement: *The purpose of this blank is to help to discover special interests and abilities by suggesting how to observe one's own likes and dislikes.* Nevertheless a tabulation of the results does give a cross-section of the minds of these high-school students at the time of filling out the blank.

Paired Contrasts in Working Conditions

The second innovation to which attention may be directed was the presentation of *pairs of contrasts* between some or all of which the pupils would find distinct differences in their own interests. This portion of the blank is represented in Table II. It was suggested by the contrasts which Dean Herman Schneider[1] of the Engineering College at the University of Cincinnati, had found useful in practice. The ratio of selections for boys and for girls is shown for each pair. The attempt was made so to state each number of contrasting pairs that either one of the pair would indicate a commendable characteristic of the individual depending upon the kind of work. The direction to the pupil was: "So far as you can notice a difference in your own interests

[1] "Selecting Young Men for Particular Jobs." See Bloomfield Meyer, *Readings in vocational guidance*. New York: Ginn & Company, 1915.

TABLE II.—INTEREST CONTRASTS

Contrasted Working Conditions	Ratio		Number of Cases	
	Boys	Girls	Boys	Girls
Slow movements Rapid movements	1 6.7	1 7.3	710	815
Less responsibility More responsibility	1 6.1	1 3.9	706	796
Doing the same thing Wide variety in work	1 5.1	1 5.8	722	834
Methodical work Meeting new conditions	1 6.5	1 5.0	676	775
Regular time for work Irregular time for work	7.7 1	9.4 1	725	865
Larger future success Smaller immediate success	15.6 1	7.7 1	715	830
Work requiring calmness Work requiring enthusiasm	1 1.7	1 2.9	710	827
Changing from place to place Always working in the same locality	1.2 1	1 1.1	696	817
Greater pay with risk or discomfort Less pay with more safety and comfort	1 2.3	1 5.2	694	832
Indoor Outdoor	1 3.3	1 1.6	699	813
Original Imitative	9.6 1	7.8 1	648	778
Planning Carrying out plans	2.0 1	1.1 1	657	775
Skilled hand work Skilled heavy work	3.4 1	8.8 1	619	718
Broad planning Attention to details	1 1.6	1 2.0	624	724
Directing Following directions	3.3 1	1.4 1	664	782
Working by yourself Working with others	1 1.5	1 1.5	704	802
Working with things Working with people	1 1.0	1 3.7	666	799
Thoughtful hand work Thoughtful head work	1 5.2	1 3.4	687	804

Table reads: Rapid movements were preferred to slow movements 6.7 times as often among the boys and 7.3 times as often among the girls, these figures being derived from the responses of 710 boys and 815 girls, etc.

between each of the following contrasts, check those *working conditions* which appeal to you."

The individual peculiarities of the pupils are brought out clearly by these paired contrasts. When a pupil's record is compared with the general trend of the high-school pupils, it is possible to show him at once in what interests he is strikingly different from the rest of his group. For example, eight out of nine boys and nine out of ten girls checked "regular time for work" as contrasted with "irregular." For those who prefer regular time for work this is not important but for the one boy in nine who checks "irregular time for work" the vocational counselor has at once a promising point of inquiry as to the special interest of the boy. It is these special and individual characteristics which are most difficult to discover and which should prove most illuminating within the general level of mental ability of high-school pupils. A pupil who is quite unusual in a number of these choices has thus a cue to his individuality—a cut which offers a new approach to his vocational adjustment if he hopes to utilize his personal incentives. Such knowledge on his part may suggest the type of work, within any one of a number of broader fields, in which he seems likely to find most happiness.

A number of sex differences became evident. For example, 20 percent of the girls compared with 14 percent of the boys chose "less responsibility"; 26 percent of the girls and 37 percent of the boys chose work requiring calmness rather than enthusiasm; 16 percent of the girls and 30 percent of the boys preferred "greater pay with risk or discomfort"; 38 percent of the girls and 23 percent of the boys preferred indoor to outdoor work; 48 percent of the girls and 33 percent of the boys preferred planning to carrying out plans; 58 percent of the girls and 77 percent of the boys preferred directing; 79 percent of the girls and 50 percent of the boys preferred working with people rather than with things. These differences seem to be quite in line with what might be anticipated as to the sexes and therefore support the validity of the method.

This section of the blank has proved so suggestive that the method of "paired interest contrasts" has been further developed

by the writer and utilized in connection with the record of personal history filled out by each freshman entering the Carnegie Institute of Technology. Thirty-five contrasting pairs were included in the blank for entering freshmen. From this larger number of contrasts it seems possible to distinguish differences among groups of students entering different courses in the same college, for example, between those specializing in secretarial work and in household economics.

Other Sections of the Blank

That part of the blank which lists a series of desirable personal traits, among which the pupils are to check the strong and weak traits in themselves, shows some results which suggest the difficulties of utilizing such information in connection with vocations. However useful it may be for a pupil to evaluate these traits in himself, nobody has yet demonstrated that any of them are more important for one vocation than for another. Further to understand the results of the present study, the actual procedure followed on the blank should be noted. This section was headed as follows:

> Among the following Desirable Traits underline the *seven* in which you are strongest and in which you could trust yourself most to meet the competition of others. Among the seven, underline with two lines the *two* strongest in you. Among all the traits given below, place crosses before the *two* in which you are the weakest.

This was followed by the list of traits, beginning with those of the more intellectual type. These were: accuracy, common sense, concentration, foresight, imagination, information, initiative, judgment, memory, originality, planning, quickness, reasoning, thoroughness.

Another group of traits followed emphasizing volition and emotion: ambition, cheerfulness, convincingness, courage, courtesy, energy, enthusiasm, health, helpfulness, honesty, industry, leadership, loyalty, neatness, obedience, patience, perseverance, reliability, self-control, tact, self-reliance, resourcefulness, temperance, uprightness.

A random sampling consisting of the responses from about 250 boys and 250 girls was tabulated. This indicated which traits were more likely to be checked. Honesty, for example, was most frequently marked, i. e., by 17 percent of the boys and by 24 percent of the girls. The traits most often regarded by the boys as one of their two strongest charactertistics (with their frequencies per thousand) were: honesty, 172; ambition, 91; common sense, 68; health, 58; imagination, 48; loyalty, 48; obedience, 44; cheerfulness, 41. Traits similarly regarded by the girls were : honesty, 243; common sense, 67; health, 67; imagination, 61; obedience, 61; memory, 47; cheerfulness, 45; self-control, 40.

The traits most frequently marked as weakest by the boys (with their frequencies per thousand) were: patience, 120; accuracy, 88; concentration, 83; leadership, 73; imagination, 73; memory, 73; quickness, 54; convincingness, 46. Traits similarly marked by the girls were: patience, 112; leadership, 95; accuracy, 82; concentration, 67; imagination, 63; foresight, 58; quickness, 54; memory, 46; planning, 46.

To a considerable extent these strong and weak traits represent the qualities for which pupils in school are most commonly praised or blamed. They reflect the comments of teachers and relatives. It may be added, however, that the opinions of the closest acquaintances of these pupils in general agree with the responses of the pupils themselves.

An attempt was made to discover whether there was a correspondence between traits regarded as strong and preferred vocations. This was done by examining first the traits underscored by the boys who chose the following four kinds of work activities: "construction work," "advisory service," "scientific work," and "recording and systematizing records." Examination was then made of the traits underscored by girls who preferred "recording and systematizing records" and "teaching." Four of the seven traits most frequently regarded as strong by the boys in each of these four fields were also among the six strongest among all the boys. Four of the seven strongest traits among the girls choos-

ing teaching and record keeping were also among the seven strongest among all the girls. As pronounced a similarity appeared for the traits marked weak. The prospect of finding broad traits like those listed which differentiate occupational interests is, therefore, not promising. When any series of traits is used, it would be better to ask the pupils to consider the traits not generally but in relation to the vocation they are contemplating.

Interests in School Subjects

The vocational significance of preferences for certain groups of subjects like commercial subjects, art, music, industrial subjects, and mathematics, seems fairly clear in many individual cases. The general distribution of the preferences among 582 boys and 736 girls selected at random is given in Table III. In filling out this part of the blank, pupils were directed to indicate the *two* groups of school subjects that had most interested them. . Under each group was printed a list of specific subjects, and in each of these lists the pupils were asked to underline their preferences. They were also requested to put a "T" before the preferred groups of subjects for which their interest was due mainly to the teacher and an "S" where the interest was due mainly to the subject itself. First and second choices and preferences due to subjects and teachers are combined in Table III.

Activities carried on outside of school for recreation or otherwise, were sounded out by a section of the blank headed: "What

TABLE III.—INTERESTS IN SCHOOL SUBJECTS

Groups of Subjects	First and second choices per thousand		Groups of Subjects	First and second choices per thousand	
	Boys	Girls		Boys	Girls
Art	41	81	Household Economics . . .	0	118
Commercial Subjects	124	225	Industrial Subjects	180	4
English	110	228	Mathematics . . .	134	66
Foreign Language	70	88	Music	32	84
History and Civics	74	48	Science	234	58

do you do OUTSIDE OF SCHOOL, for recreation or otherwise, that you think will help you in your future occupation? For example: kind of reading, your hobbies, exhibitions or places you visit, your work in church, clubs, etc., etc." The answers of 117 boys were examined; 38 were found to be vocationally suggestive and 7 slightly so. For 73 girls, 22 were suggestive and 10 slightly so. Naturally the majority are not differentiated by those avocations.

Summary

The idea of helping high-school students to observe their own vocational tendencies was tried out with considerable success. The method was to fill out a blank which analyzed and summarized those interests which bore more or less directly upon vocational satisfactions. Employment experiences, school subjects, contrasting work conditions, avocations, etc., were brought under consideration. In asking for a choice, the occupational fields were classified according to the types of activities emphasized. The table of common tendencies in marking pairs of contrasted interests affords a basis for noting individual peculiarities. This and the preliminary occupational classification are new features which seem promising. Even as a group exercise the method proves stimulating. Parents become interested when the pupils take the blanks home for discussion, and vocational counselors find them an excellent introduction to their interviews.

Suggestive Blanks

Atlanta, Georgia, Vocation Bureau, George D. Halsey. *The "averaged-opinion" plan of vocational guidance.*

Bureau of Personal Research, Carnegie Institute of Technology, Pittsburgh, Pennsylvania. *Interest analysis blank.*

Business Training Corporation, New York, New York. *Self-analysis. In its course in modern production methods.*

Erie, Pennsylvania, School District. *Self-analysis for counseling purposes.*

National Institute for Moral Instruction, Chevy Chase, Washington, D. C. *The perfect human being.*

Puffer, J. Adams, Hudson, Massachusetts. *Vocational guidance Chart for men.*

Rugg, H. O. "Self-improvement through self-rating: a rating scale for judging high school or college students," and "Self-improvement of teachers through self-rating." *Elementary School Journal*, 20: 670-684. 1920.

Yerkes, Robert M., and La Rue, Daniel W., *Outline of a Study of the Self*, Harvard University Press, Cambridge, Massachusetts.

Young Men's Christian Associations, International Committee. Boy's Work Committee. *Self-analysis blank.*

Young Men's Christian Association of Chicago, High School Department. *Individual analysis blank.*

INTELLIGENCE AS RELATED TO NATIONALITY

GILBERT L. BROWN
Northern State Normal School, Marquette, Michigan

This investigation grew out of a study of retardation in the schools of several cities in northern Michigan in which it was discovered that the amount of retardation varied among children of different nationalities. Since the pupils of all nationalities had the same teachers and were pursuing the same course of study, it was evident that there must be some underlying cause of the difference in retardation. Accordingly, it was decided to give intelligence tests to a considerable number of each nationality to determine whether or not the differences in retardation might be the result of differences in intelligence. At the present time 913 children whose parents were born in foreign countries have been given intelligence tests.

METHOD OF INVESTIGATION

The Stanford Revision of the Binet Scale was employed throughout the investigation. Group tests would not have been practicable, especially in the lower grades, because the children of foreign parents have not ordinarily become as responsive as American children, and because many of them do not understand the English language sufficiently well to follow directions.

It was soon found that language presented the chief difficulty in testing the children, although this problem generally disappeared above the first grade if the pupil had entered the kindergarten in this country, of above the second grade if he had entered the first grade in this country. In other words, it was found that after a pupil had attended an American school for one or two years, he tested as high by employing the English language as by using his native tongue. Of course, there were some exceptions to this general principle, since children vary greatly in their ability to learn language. In all cases, however, in which there was any doubt as to a pupil's ability to understand English sufficiently well to pass a test, he was given the test in his native language. Not infrequently we found children who, although they spoke

the English language fairly well, tested from six to eighteen months higher when their native language was employed.

Results

Pupils representing nine nationalities have been studied. These are the Norwegian, German, Swedish, English, Austrian, French, Finnish, Slovak, and Italian. Table I shows the distribution of the nationalities according to intelligence quotients; Table II, the percents of the nationalities at each mental level and the theoretical distribution as suggested by Terman.

TABLE I.—DISTRIBUTION OF 913 SCHOOL CHILDREN ACCORDING TO INTELLIGENCE AND NATIONALITY

Class	Intelligence Quotients	Norwegian	German	Swedish	English	Austrian	French	Finnish	Slovak	Italian
Genius or "near" genius	Above 140	0	0	0	1	0	1	3	0	0
Very Superior	120–139	1	9	24	16	2	15	13	0	1
Superior	110–119	4	14	37	10	3	15	21	3	0
Normal	90–109	24	30	84	41	15	87	98	7	11
Dull	80–89	3	10	29	9	3	47	43	9	10
Borderline	70–79	2	4	8	7	4	25	32	9	15
Moron	50–69	0	0	3	3	1	7	13	3	13
Imbecile	20–49	0	0	2	3	0	2	3	0	1
Total		34	67	187	90	28	199	226	31	51

TABLE II.—PERCENT OF CHILDREN AT EACH MENTAL LEVEL

Class	Theoretical Distribution	Norwegian	German	Swedish	English	Austrian	French	Finnish	Slovak	Italian
Genius or "near" genius	0.25	0	0	0	1.1	0	0.5	1.32	0	0
Very Superior	6.75	2.9	14.0	12.7	17.7	7.14	7.52	5.75	0	1.96
Superior	13.00	11.6	21.0	19.6	11.1	10.80	7.52	9.30	9.70	0
Normal	60.00	69.6	49.4	44.5	45.5	53.57	43.66	43.30	22.58	21.56
Dull	13.00	8.7	12.0	15.4	10.0	10.80	23.60	19.00	29.00	19.60
Borderline	6.00	5.8	3.5	4.2	7.7	14.28	12.55	14.16	29.00	29.41
Moron	0.75	0	0	1.6	3.3	3.57	3.51	5.75	9.70	25.49
Imbecile	0.19	0	0	1.0	3.3	0	1.32	1.32	0	1.96

The difference in the intelligence of the various groups may be expressed by the medians of the intelligence quotients, and by the percents below "normal" intelligence. These data are shown in Table III. It is clear that in the case of the children tested there is a wide range of intelligence, based upon nationality.

TABLE III.—MEDIAN INTELLIGENCE QUOTIENTS AND PERCENTS BELOW NORMAL

Norwegian	German	Swede	English	Austrian	French	Finnish	Slovak	Italian
103.75	102.3	101.9	101.75	99.5	95.4	90	85.6	77.5
14.5	15.5	22.2	24.3	28.65	40.96	40.23	67.23	76.56

Discussion

An examination of the above tables brings out the interesting fact that all the Germanic groups—Norwegian, German, Swede, English, and Austrian—test higher than any of the non-Germanic groups. This agrees with results obtained in the army, and tends to confirm the belief held by many that the best type of immigrant comes from the countries of northern Europe.

This fact also throws light upon the problem of retardation and elimination among the various nationalities. The cause of these school conditions has been commonly regarded as primarily social, but it is at least pertinent to inquire whether the chief cause may not be difference in intelligence. A recent study of the retardation of 1700 children of immigrants in two cities of northern Michigan shows that retardation according to nationality follows very closely the median intelligence quotients of the nationalities as given in Table III.

The extremely low intelligence quotients of the Italians may be accounted for in part by the fact that the children tested belonged to two mining locations in which the work pursued by the men is unusually slavish. The employers of labor in these locations recognize the low mentality of their employees and one of them stated frankly that men of higher intelligence would not remain in the location because of the character of the work. Yet, it must be observed that, although the children of all nation-

alities tested low in these locations, none tested so low as the Italians. It is also significant that in these locations very few Italian children reach the eighth grade; most of them fail to advance beyond the fourth or fifth grade.

Probably the point of greatest significance lies in the fact that so large a percentage of children tested below "normal." This type of pupil impedes the progress of other children in school and, because of repeating the work of the same grade, causes additional school expense. Furthermore, if the school is to offer proper training for such children it must provide a course of study different from the one now offered.

The importance of the mentality of immigrants is not confined, however, to the field of education. The admission into this country of large numbers of immigrants of relatively low intelligence presents two problems of primary importance when viewed from the standpoint of national welfare. First, this type of immigrant increases the amount of crime and pauperism. This would be expected since it seems well established that a rather high correlation exists between low intelligence, on the one hand, and crime and pauperism, on the other. Second, low intelligence among large numbers of immigrants means that in coming generations the general intelligence of the American people is likely to be lowered, because the number of children in the homes of such people is much greater than the number in the homes of people of higher intelligence. These problems should make it clear that, in establishing conditions for admission into the United States, the intelligence of the immigrant is of vastly greater importance than the number of dollars which he possesses. Furthermore, they mean that the method of determining the number of immigrants to be admitted by the percentages of the various nationalities already in this country is fundamentally wrong, since the intelligence of immigrants from some countries is decidedly superior to that of the immigrants from other countries..

Editorials

THE HISTORICAL METHOD IN EDUCATIONAL RESEARCH

The tendency is altogether too evident to restrict the term "educational research" to a particular field. Research is not a field but a method, a way of approach to the solution of problems. It is also a point of view. Not only the making of tests and the use of them, but child and financial accountancy, curriculum and textbook analysis, buildings and building programs, and a host of other topics offer opportunities for investigation. Although the present educational research worker may dissent from our views, we venture the assertion that the history of education likewise affords a field for original inquiry and that this field is particularly interesting and stimulating. Quite commonly we hear the opinion expressed that the history of education has little practical value. Except as this opinion relates to certain wooden ways of teaching and writing about the subject, we dissent from it. We believe that much that is practical—even the kind of practicality upon which the most pragmatic of modern researchers insists—may be derived from the right kind of treatment of historical material.

Consider writing as a school subject. An adequate historical treatment of the way writing has been taught and of the social demand for it will give us a useful basis of criticism for present practice. It is clear that the social demand has undergone enormous changes. Vestiges of the former condition remain with us in our phrase "the three R's"—one of the R's, with sturdy disregard for modern spelling, standing for writing.

The former status of handwriting interprets and explains its present status. But it can only be vividly apprehended by reference to historical data. In the Colonial period the newspapers

contained many advertisements of writing teachers. Professor Robert F. Seybolt of the University of Illinois has a fine collection of them and it is to him that we are indebted for a slight acquaintance with them. These advertisements show unmistakably the high estimation in which "a good hand" was then held. We have space to consider but one set of them. William Elphinstone advertised first in the New York Gazette (1753) that "Persons of both Sexes from Twelve Years of Age to Fifty, who never wrote before, are taught to write a good legible Hand in five Weeks, at an Hour a Day, at home or abroad; and such as write but indifferently may have their Hands considerably improved." A year later Mr. Elphinstone was in Philadelphia where he advertised in a similar manner in the Pennsylvania Gazette. Returning to New York, he again published his promising announcement. He also lived in Boston where his "card" appeared in the Weekly News Letter (1755).

Announcements such as those of Elphinstone—and they were surprisingly numerous—establish, upon a firm historical basis, the fact that writing was at that time vastly more important as a personal accomplishment than it is now. Indeed, we scarcely have in this age a class of teachers resembling the writing teachers of Colonial days.

Moreover, historical inquiry will give us the fact basis of the social demand for writing. Until comparatively recently all records, documents, and communications, except those of which many copies were desired, had to be handwritten. Conveyances, mortgages, judgments, etc., were not only written by hand but were copied for legal record by the same process. Letters were written, as were reports and memoranda of every description. The works of novelists, essayists, and poets were all handwritten. The scrivener plied his trade.

The historical treatment will record the more recent advent of the typewriter and will show the number of offices in which these machines were placed. The book typewriter replaced the hand copying of records, and listing machines together with loose-leaf and card records modified the processes of bookkeep-

ing. Boys and girls still learn to work in offices, but for this purpose they learn typewriting rather than handwriting. Indeed, writing by hand, it may be shown, is now generally done only by those who have little of it to do.

The historical treatment of the question of writing will also bring out the fact that there is not only a smaller demand for this school product but also that the demand is different in kind. In earlier days there was a widespread demand for excellent quality of handwriting. To say that a person "wrote a good hand" was to bestow high praise. Indeed, the ability to write well was taken as unmistakable evidence of culture. Today it is doubtful whether people who write more skillfully than legibility requires win any appreciable praise or take any particular pride in their accomplishment.

When the investigator has by the historical method brought matters down to this point, he may adopt some of the more conventional methods of the day. He may show, for example, by experimental data that writing of Quality 12 on the Thorndike scale or of Quality 65 on the Ayres scale is practically as legible as handwriting can be. From this he will deduce that prolonged practice in writing after this degree of legibility has been secured is a waste of time. He will point out that as writing has become less of a business asset, the value of unusual skill has been greatly diminished, that decorative and artistic qualities are seldom considered, and that accordingly, the task of the school has become relatively simple. Here he may give evidence to show that, despite these facts, the schools are continuing to do the traditional thing. The dead hand is upon them. New writing systems appear regularly. Boys and girls are drilled on ovals, loops, and lines which bear no resemblance to the letters of the alphabet. We still act as if we believed implicitly in formal discipline, although in theory we deny it. Adverting to the psychology of learning, the investigator may call to our mind the fact that if we wish to engender an ability or organize a habit, we should teach the thing directly and drill upon it directly. "By indirec-

tions to find directions out" is discredited by the psychologist while it is practiced by the school teacher.

The historian of education, therefore, may point out that in handwriting the school has failed to adapt its curriculum to changed conditions; and it is his peculiar privilege to show why this is true. Writing, however, is only an illustration. Other school subjects either present similar conditions or offer from other points of view instructive lines of investigation for the historian. Nor is this less true of matters of school organization, teacher training, salaries, and methods of teaching than it is in the case of the curriculum. Moreover, the historian always has, or should have, within his view the development of society and the extent to which modifications in the school are adapted to social conditions. Contributions exemplifying methods of historical research as applied to questions of educational import will be gladly received for publication in the JOURNAL OF EDUCATIONAL RESEARCH.

B. R. B.

THE SUPPORT OF PUBLIC EDUCATION

It was heartening to hear Professor Seligman declare before the Department of Superintendence at Chicago that we are well able to support public education in the United States. He called attention to the fact that we are the wealthiest people in the world, and that our wealth and income have increased rather than diminished during the decades just past. In his discussion of the methods which must be employed to provide the necessary funds for education he stated that economic changes occurring during the past few decades have rendered reliance on the general property tax unsatisfactory. That the general property tax does not measure ability to pay taxes has long been established. It is not possible to tax intangible property which represents in the aggregate a very large part of our wealth. It is equally clear that there is no fixed relationship between property values and income derived from property. The assessed value of a farm or factory does not represent the profit accruing to the owner in either case.

It is obvious that two merchants having at a given time the same amount of property will vary tremendously in their ability to pay taxes during any fiscal year due to the period of turnover and to other considerations. There are large professional incomes which may entirely escape taxation under the general property tax.

If the increasing wealth of locality, state, and nation is to contribute its proper share to the support of public education, we shall have to revise our revenue system by taxing earnings, profits, and income. Professor Seligman pointed out that it was necessary to develop on the one hand the personal income tax, and on the other hand the business tax to include not only corporations but other businesses. With the basis of taxation broadened, greatly increased revenues will be available for the maintenance of schools and for other forms of governmental service.

We need to scrutinize our expenditures for public education and to improve our practices in the field of fiscal administration. Better budgetary procedure and accounting than are now found will form the necessary basis for a more efficient administration of our schools. But while we work to eliminate waste and to increase our efficiency we must at the same time examine carefully our systems of taxation in the several states and work for the development of revenue systems which will make it possible to tax our citizens in terms of their ability to pay. Because of our interest in public education, we shall have to become students of taxation. As we become convinced that the general property tax is unsatisfactory, we shall have to join with other enlightened citizens for the development of a better revenue system. It is high time that those who are interested in providing adequate support for public education in the United States turn their attention in this direction.

G. D. S.

Reviews and Abstracts

YEOMANS, EDWARD. *Shackled Youth.* Boston: The Atlantic Monthly Press, 1921. 138 pp.

Having read this book with a good deal of care, the reviewer approaches his task with some temerity. The author has so often and so vigorously declared himself to be the advocate of little children, (and withal said so much with which everyone will agree,) that negative criticism will be resented by the uncritical reader. He will doubtless be more ready to see a reflection of the reviewer's blindness, or inertia, or sterility, or any other of the numerous attributes which Mr. Yeomans has assigned to the school people of today, than to realize that nothing is true simply because some one has declared it to be so.

The subtitle "Comments on Schools, School People, and Other People" suggests the field but gives little clue to the burning message the author feels called upon to deliver. The keynote is contained in the following quotation (p. 6): "We dare to say—that there is only one kind of person really eligible as an administrator or teacher of a school—namely, an artist; for is not teaching an art?" A great many of us will agree, and yet if you and I and Mr. Yeomans should together observe a teacher or an administrator at work, it is quite conceivable that we might disagree among ourselves as to whether the person observed were an artist, or at least as to the degree of his artistry.

The ideal teachers of history, geography, etc., who are presented to us by Mr. Yeomans merit our admiration and challenge our efforts. But do all teachers fall into the two classes,—a fraction of one percent such as are described for our edification, and ninety-nine plus percent the pitiable caricatures which are sketched for the sake of contrast? Moreover the questions these caricatures ask show plainly that the writer knows little of what is really taking place in literally hundreds of schoolrooms throughout the nation, or else he has deliberately caricatured for the sake of contrast.

We prefer to believe the former. We should rather think that Mr. Yeomans, having caught a glimpse of the thrill which children receive when in contact with one who knows and loves his own field of knowledge, and having seen a few sterile teachers and remembered perhaps his own unfortunate youth in a New York suburb, has reached the conclusion that practically all our children are shackled, somewhat as he ascertained in another connection that "ninety-five percent of all children are average."

On the whole the book is worth reading by the critical. He who is sensitive to the ideal will draw inspiration from certain characters portrayed; he who will evaluate the unsupported statements will draw no discouragement or pessimism therefrom. If you are critical and a teacher, you may still return to

your schoolroom with joy in your heart and feel that you are not necessarily deficient in either the sense of smell or sight because you do not perceive that "all you are doing is to keep the pot boiling and that out of that pot comes a very bad smell" or that "evidently [the schools] are not functioning in such a way as to justify any more hope for increased happiness, for Peace on Earth, Good will toward Men than the present state of society, the level of each being the same."

E. J. ASHBAUGH

Ohio State University

WEATHERSBY, WILLIAM HENINGTON. *A history of educational legislation in Mississippi from 1798 to 1860.* (Supplementary Educational Monographs, No. 16.) Chicago: University of Chicago, 1921. 204 pp.

This is the third of the University of Chicago monographs prepared under the direction of Dr. Marcus W. Jernegan on the history of educational legislation in various states in the first half of the nineteenth century. As in the two preceding studies, much valuable and ordinarily inaccessible material has been made available, and this, together with the discussions of factors accounting for legislative enactments and their results, constitutes a history of the state school system in an important and long neglected phase of its development.

The educational history of Mississippi is interesting because the state is located in a section of the country which has received little attention from historians of education and because, as Dr. Jernegan points out, its settlers came largely from the "back-country" of the older southern states into an environment that was essentially western. Conditions in the southwest therefore approximated those in the Northwest Territory. The question may well be raised, says Mr. Weathersby, whether the educational history of Virginia and North Carolina applies to the states of Alabama, Mississippi, Arkansas, and Louisiana with any greater degree of accuracy than the stories of the development of New England and New York apply to the states of Ohio, Indiana, and Illinois.

In the earlier chapters of the book the influences affecting school legislation and general characteristics are discussed. These last, as relating to common schools, are listed as follows: (1) the development of township schools, built usually upon the sixteenth section with income from the same; (2) the tendency to make the township the unit of control; (3) a general absence of central control; (4) the education of orphans and poor children at the expense of the state; and (5) a reluctance to impose direct taxation for common schools. As a result of these tendencies we have the development of a "democratic, decentralized school system, designed to meet the needs or demands of individual counties or even smaller units."

Interesting parts of the monograph deal with federal and state aid to education. Chapter IV traces the history of the sixteenth section lands and the Literary Fund. The policy of township control, the authorization of ninety-nine year leases, the investment of state and township funds in the Planters' Bank and its subsequent failure, tell the story of the management

and loss of these lands and moneys. In Chapter XI the various means of school support during the period are summarized and classified.

The two appendices are noteworthy features of the book. The first consists of abstracts of charters of academies and higher schools; the second is a complete index of educational legislation in Mississippi prior to 1860, by titles of acts. These, as Dr. Jernegan states, contain "invaluable material for studies involving a history of comparative legislation." It is, however, to be regretted that the text of the most important laws has not been presented in the original form. A third appendix containing as much of the legislation as practicable, would constitute a valuable addition to the abstracts and summaries of the main part of the book.

Mr. Weathersby's monograph is the first important work on the history of education in Mississippi as well as the only work of its kind dealing with the educational development of the group of states which Mississippi represents. It is therefore a very real contribution to the history of public education in the south and in the United States.

JEAN H. ALEXANDER

University of Minnesota

THORNDIKE, E. L. *The Teacher's Word Book.* New York: Teachers College, Columbia University, 1921. 134 pp.

While not pretentious in its paper binding, this book contains the results of the most extensive investigation of its kind ever attempted. Dr. Thorndike says he has been gathering this material for ten years. It consists of an alphabetical list of the 10,000 most widely used words, as determined by a count of 4,565,000 from forty-one different sources. It is hoped that such a word list, according to the author, may prove of service to teachers in at least the three following ways:

1. To decide the pedagogical treatment to use for words offering difficulty to the pupil. In any one grade many words "probably should not be taught at all in that grade; others should be explained at the time to serve the purpose of the story but then left to their fate; others should be thoroughly taught and reviewed."

2. By use of the book, the beginning teacher can get a knowledge of the importance and difficulty of a word which an older teacher acquires only after years of experience.

3. It provides a convenient place where teachers can record useful facts about the teaching of a word, which will serve as guides for future teaching, such as the following: in what grade the word should be taught; in connection with what subject; and by what device.

The writer believes it will also prove of value to research workers by helping them to choose words which are to be used in tests and by aiding them in wording explanations and directions so they will be understandable to the pupil.

The list is not perfect, as Dr. Thorndike realizes. Further investigation will probably substitute a great many words for the ones now included. Its

value in the present form cannot be questioned and it is a book which every teacher should own.

WARREN W. COXE

Ohio State University

GRAFF, ELLIS U. *Essentials in Education.* Indianapolis: Bobbs-Merrill, 1921. 245 pp.

If brevity is the soul of wit, then indeed Superintendent Graff has a wise and valuable book. He has been too ambitious. A perusal of the table of contents will reveal that he has attempted, in one brief volume, to run the whole gamut of educational problems: the teacher, teaching as a profession, curriculum, psychology, sociology, school administration, health work in the schools, school architecture, school building standards, school equipment, educational measurements, specialization in education, education and the nation, etc. The reviewer cannot but believe that the book would have been much more interesting and valuable had the author greatly reduced the number of vital subjects which he has introduced in the twenty-five chapters—each chapter devoted to a different subject.

A study of the chapter on methods will serve to illustrate the wide range of topics discussed in each of the other chapters, as well as the brevity of the treatment.

Many of the subjects, which are so briefly presented, have been the theme for a larger volume than this one. To a subject as important as "Methods of Teaching" (the title of chapter four) the author devotes fourteen pages. The first page or two of this chapter is a philosophical discussion of the aim of education. This is followed by a very brief psychological analysis of the principle of apperception, the doctrine of interest, individual difference, attention, association, reasoning, training the will, the emotions, and one paragraph to a consideration of special methods. For those who seek enlightenment on methods of teaching, this book would offer but little help.

We have no criticism of the author's viewpoint. The reader is impressed with his wide acquaintance with the best to be found in educational literature. We do not take issue with his philosophy, his psychology, or his position on other questions presented. Our quarrel with him is that he is too brief—the student is left to read too much between the lines.

Essentials in Education presents no new thought; it contains nothing original. In a clear, concise, and interesting style, many of the topics that have been widely discussed in recent years, are presented. The book is a popular statement of the trend of modern educational thought. It is not too technical for the "average citizen" to understand. It is a book that could easily be read and appreciated by high-school classes interested in teacher training or by first year normal-school students, as an introduction to teaching. Some of the state reading circles will probably find it a valuable text. *Essentials in Education* might well be called a summary of accepted modern educational practices.

H. L. DONOVAN

Eastern Kentucky State Normal School

LULL, HERBERT G. and WILSON, H. B. *The redirection of high school instruction.* Philadelphia: J. B. Lippincott Company, 1921. 286 pp.

The book sets forth "a program of instruction from the viewpoint of the social and psychological needs of high school students." These needs are analysed respectively in the second chapter on "The Social Core of the High School Curriculum" and in the fourth chapter on "Project-Problem Instruction." The remaining chapters describe the application of "socialized" and "project" methods to the prescribed subjects of junior and senior high school, to vocational and professional training, and to the end of cultural development. The final chapter contains surveys to classify the occupations of a typical small city as resources for socialized instruction and to describe various high schools in process of reorganization along the lines proposed. Pages 131-4 exhibit score cards to rate the success of teacher and pupils in project work. A classified bibliography is comprehensive and confined to references of very recent date.

The authors frankly urge that socialized and project methods are necessary in the secondary school if potential values are to be secured. The distinction is clearly drawn between the mere acquisition of technic and the use of this technic in such life situations as can be brought within the classroom. Each of the chapters bears upon this issue. Their cumulative effect should shake one's faith in purely formal methods. Considered therefore strictly as wholesome propaganda the entire work is admirable. By virtue of its popular appeal it should prove an excellent introduction to more comprehensive studies of the problems involved.

The effectiveness of certain forms of project work in the case of certain pupils is convincingly presented in the typical projects described. Taken together these illustrative chapters constitute a manual from which most teachers can select much of real value. Others, however, may easily be misled by the apparent finality of the argument. The restriction of content to what is largely familiar to the pupil and hence functional in itself, is no guarantee that the learning will function in the pupil's experience. Motivation for its own sake is worthless; hence the economy of the high-school project can be fairly judged only by comparison with other means of attaining the desired objectives. 'Know your pupils' is a better slogan than 'use the project method.' The reader should be cautioned against the exclusive use of methods that are not equally effective in all types of learning and which perhaps do not fully recognize the limitations of available teaching materials.

The criteria of high-school instruction are based on the pupils' "social" needs and these needs are interpreted in terms of the specific activities in which they are likely to engage. Chief emphasis is therefore placed on direct values. Instruction aims to secure appropriate responses to specific future situations by approximating these situations within the school. There is no question but that more of such instruction is desirable. Failure to secure these direct and specific values is too often minimized by the assumption that indirect and general values must automatically result. The limited abilities of many pupils doubtless justify this emphasis of direct values *for them.* One must however question whether these specific situations that the class is trained to meet are

actually encountered later by the majority of pupils and, if so, whether the acquired response is adequate. The limitations of teaching materials in most high-school subjects render both questions doubtful. Thus, for many pupils at least, greater economy is to be expected from the teaching of general concepts by materials organized with this particular aim in view. Though less readily identified with future needs, such learning is no less social than the outcome of project instruction since the project consists rather in what the pupil wants to learn than in what the social environment is. This distinction is not trivial if it helps to indicate a shortcoming of many discussions of subject values from the standpoint of motivation; namely, the failure to recognize the scope of future application as equal in importance to the degree of pupil response. The authors have outlined a program which is definitely helpful in the securing of direct values and as such it deserves high distinction. Yet the objective toward which high-school instruction might more safely be redirected is an effective combination of the specific value of the project and the more general value of methods that have still to be clearly formulated for the high-school program as a whole.

DOUGLAS WAPLES

Tufts College

Course of study monographs, Public Schools, Berkeley, California. Introductory—The Course of Study in the Work of the Modern School, Superintendent H. B. Wilson, 14 pages. Number One—Arithmetic, 91 pages; Number Two—Home Economics, 56 pages; Number Three—Nature Study, 104 pages; Number Four—Geography, 117 pages; Number Five—Penmanship, 28 pages.

These monographs, the results of committee reports and class-room testing, were issued in 1921. Others are to follow for the remaining school subjects. The Introductory Monograph by Superintendent Wilson, defines the aim of education as social efficiency, comprehended as including efficiency in five aspects of life—vital or physical, vocational, civic, avocational, and moral and religious. In each subject monograph, the place of the subject in contributing to these respective aspects is specifically stated. The outcomes of the subjects by which these forms of efficiency are achieved are stated for each half year in each subject outline in terms of knowledge, habits or skills, and attitudes.

According to the point of view stated by Superintendent Wilson, "The course of study should be so written and organized as to be an inspiration to the teachers in their work . . . It is not sufficient if it merely indicates the general scope . . . How (topics) should be varied to suit differences in pupils must be specified. In fact, all choices which depend for their correctness upon scientific investigation and research studies must be made for the teachers by the course of study . . . It must . . . indicate methods and procedures recommended because of their proven value . . . Standards of attainment expected by pupils should be set forth as definitely as possible." The respective courses therefore include much of method, procedure, outcomes, and

standards. All are well supplied with lists of equipment, sources of materials, and bibliographies; and each has a good index.

The arithmetic course is supplementary to an adopted text book, but it points to many local interests, problems, and projects; and it has many suggestions of method and procedure. Formal work is omitted until the second grade, but informal number experiences are included for the kindergarten and first grade. Standards of achievement are stated from grade III upward for the fundamental processes, and from grade IV upward for reasoning by the Starch Scale. Sixty minutes a week are given to arithmetic in grade II, and 200 minutes a week—forty minutes a day—in grades III to VI inclusive.

The home economics course includes the work for the fourth grade, where it begins, through the intermediate schools, high schools, and special schools. The work of the other monographs so far issued is for the first six grades only. The subject is planned for girls, but it is stated that "Boys and girls might exchange shop work for a few weeks. Camp cookery could be given to the boys while shop work is given to the girls." The outline emphasizes the technical aspects of the subject. The part for the elementary school is in marked contrast to the recently published course of Kalamazoo, Michigan, which is rich in informational values for the consumer, and stimulating in the variety of inquiries which its work initiates.

The nature study course deals almost wholly with plant and animal life, emphasizing gardening, elementary agriculture, study of flowers and birds, and care of pets. Extended suggestions for a great variety of school and home projects are made for each grade. The work is attractively presented, and most of it well illustrates "activity that leads to further activity."

In the course in geography, considerable space is devoted to procedure, suggested projects, discussion of types of lessons, and the use of local sources of material and points of approach. The work begins in the third grade with a study of the lives of children from ten different countries. The first half of the fourth year is devoted to a study of California, the second half to a study of the world through products. To the fifth grade are assigned North America, South America, Australia, and the Pacific Islands, and to the sixth grade, Africa, Asia, and Europe in this order. Sixty minutes a week are given to geography in the third grade, ninety in the fourth, 125 in the fifth, and 150 in the sixth. Geography receives less than one half as much time as arithmetic in the Berkeley schools. The topics and problems suggested are well chosen with reference to geographic interests of our own time.

The course in penmanship is chiefly a discussion of procedure, devices, records, tests, and standards. The Ayres Scale is the basis for rating achievement. A "system" with Teachers' Manual and graded Compendium is used.

In these courses of study, there has been a definite effort to utilize the results of the scientific studies in the selection, grading, and teaching of materials. There is little evidence of any effort to coordinate one subject with another and thus derive those values of economy of both time and effort which come from treating the materials of different subjects in their relationships to common problems. But, in the Letter of Transmittal, the chairman of the general committee states: ". . . we are ready to propose our next task—a

more complete synthesis of all subjects. This would be effected by increasing the number of projects and by grading them . . . Less regard would be given to the lines of cleavage between subjects inasmuch as the experiences provided . . . would be indicated in the series of problems and projects rather than by a gradation of subject matter . . . The various studies would be drawn upon for the help each could afford . . .''

The monographs constitute a contribution in the practical field of curriculum making, utilizing the results of scientific investigations and resources so far achieved. The work is a noteworthy effort to select and organize material on the basis of values objectively measurable.

FREDERICK G. BONSER

Teachers College, Columbia University

CARTER, ALEXANDER and THEISEN, W. W. *Publicity campaigns for better school support.* (School Efficiency Monographs.) New York: The World Book Company, 1921. 164 pp.

This is one of a series of School Efficiency Monographs. Its scope is somewhat narrower than the title might seem to indicate, since it confines its treatment of publicity campaigns to cities. It is to be regretted that the authors did not feel warranted in extending the scope of the monograph so as to include campaigns for better support of rural schools, and to statewide publicity campaigns to sell education to the public. We hope that another monograph covering these fields may be issued by the authors.

The following topics and problems are proposed and discussed in successive chapters: (1) are publicity campaigns for better school support advisable? (2) the campaign staff; (3) groups to be reached by the campaign; (4) avenues and instruments of approach to the public; (5) how to select arguments and illustrations; (6) how to prepare and circulate the material for effective publicity; (7) the campaign under way; (8) examples of good publicity material used in successful campaigns for better school support.

The subject of each chapter is admirably and discriminatingly treated. The first chapter lays the foundation for the following chapters by presenting arguments that seem to show conclusively ''that *permanent* adequate support for schools is not to be had in a district unless the school policy is made clear to the voters and approved by them from time to time.'' The importance of the publicity campaign for increased funds for school buildings or for maintenance as needs arise is clearly presented. Possibly this presentation might have been strengthened had it endeavored to show the value of a continuing publicity campaign to keep the people acquainted with the work of the schools, the improvements made or needed in the curriculum, and in the administration of the schools. Such a continuing campaign to have the public know *their* schools and other schools would lighten the work of the special campaign for more money and do much to insure its success.

The conclusion of the first chapter may perhaps be summed up in the simple statement by the authors that ''there is probably not one school system in a hundred where the people can be induced to vote increased taxes for

the amount needed at the present time without a well-directed and vigorous campaign of publicity."

The remainder of the book undertakes to tell how to organize the campaign and furnishes much concrete material illustrating what and how necessary information and arguments may be presented to the public effectively.

The suggestions for organizing and training groups of individuals for special work outlined by the campaign managers, and for securing in as large measure as possible the cooperation of existing organizations are excellent. It is not to be expected that all of the suggestions and recommendations for carrying on the publicity campaigns will be adopted in any one campaign. It is evidently the idea of the authors to present material and modes of procedure from which selections may be made to suit individual cases and local conditions. It is probable that some of the suggestions would involve more detailed work than can be secured without too great expenditure of time and money. Enough practical and well considered matter is presented, however, to meet the needs of almost any community.

It is to be regretted that no consideration is given to the modes of financing the publicity campaigns. Chapter VIII gives a large amount of excellent illustrative matter which has been utilized in publicity campaigns in a number of cities and which may be readily adapted for use in other campaigns.

A well selected bibliography is given from which city superintendents or publicity campaign managers may secure valuable material to aid in organizing publicity campaigns for better school support. Every city superintendent in the United States would be benefited by a careful reading of this monograph.

L. D. HARVEY

The Stout Institute

BUSWELL, GUY THOMAS. *An experimental study of the eye-voice span in reading.* (Supplementary Educational Monographs No. 17) Chicago: The University of Chicago, 1920. XI + 105 pp.

This monograph gives a detailed account of a phase of reading ability which has been investigated only in a limited way by other experimenters. The problem is concerned with the length of the distance by which the eye leads the voice as oral reading proceeds. Elaborate apparatus which recorded both the voice and the movements of the eyes was used. The two forms of apparatus were so arranged that the two types of records could be synchronized. Thus it was possible to measure the distance between the voice and the fixations of the eyes. Elementary and high-school pupils as well as college students were used as subjects. The data are set forth clearly by means of plates, tables, and graphs. The entire study shows very careful and painstaking work on the part of the author. Only one criticism of the technique of the investigation occurs to the reviewer. This has to do with the location of the voice in the reading matter. The writer's experience with this problem has been that it is very difficult to determine the exact location of the voice by listening to the dictaphone records. The importance of the investigation would seem to warrant the use of methods which would allow the location of the voice in the

same accurate way the eye-fixations are located. However, this point does not in any way destroy the value of the results.

The conclusion is reached that a wide eye-voice span occurs in common with a good quality of reading, a rapid rate of reading, and a small number of eye fixations per line. The author emphasizes that these factors are phases of efficient, mature reading, and that therefore the development of the eye-voice span should receive attention in the methods of teaching reading.

Another important point in the discussion is the tracing of the development of the reading habit through three successive stages. First, there is a stage in oral reading where the eye, the voice, and the meaning are all focused at the same point. Second, there is a stage of oral reading characterized by a considerable distance span between the eye and the voice. During this stage the meaning occurs at a point near the fixation of the eye. Third, there is the stage of silent reading where the voice drops out of consideration, and the entire attention is given to meaning.

It is hardly necessary to say that this monograph makes a very valuable contribution to the psychology of reading, and is of interest to all students of this subject.

C. T. GRAY

University of Texas

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

E. D. Wolfe, Principal, Junior High School, Ashland, Ohio, reports an inter-grade contest this year in attendance and in spelling, in both of which satisfactory progress has been noted.

Supt. J. D. Sweeney, Red Bluff, California, sections his pupils of the fifth to eighth grades inclusive, on the basis of intelligence tests, placing approximately the better $\frac{3}{5}$ in one section, and the poorer $\frac{2}{5}$ in the other. The success of the grouping will be checked by means of achievement tests.

Professor J. W. Barton, Associate Professor of Psychology in the School of Education of the University of Idaho, has been promoted to a full professorship in Psychology. Mr. C. W. Chenoweth (M.A., Harvard), has been elected Associate Professor in Philosophy in the same institution.

Of the 342 pupils in the Parker All-Freshmen High School of Dayton, Ohio, 302 have no regular employment outside of school. 321 expect to graduate from high school, and 211 expect to go to college, according to a report from Principal A. E. Mayett.

H. E. Dening, Manchester, Ohio, reports a school band of approximately 50 pieces, in a school with only 100 children in the high school, and 350 in the grades. Though the band has been in existence only a little more than a year, it has made a sufficient reputation for itself to be invited to play at the State Fair this year. The youngest member is a fourth grader, 9 years old.

Green Bay, Wisconsin, is erecting a high school building, which will cost about $750,000. It is intended to house one thousand children. A 23 acre site has been secured which will furnish ample space for recreation with separate playgrounds for boys and girls. Separate gyms for boys and girls, shops for Vocational Instruction, and the power plant will all be outside the main building.

Nelsonville (Ohio) reports a high-school enrollment of 12 percent over last year, and more than 60 percent over 1913-14.

At the November election 100,000 dollars worth of bonds were voted for the repair of the old buildings and the erection of a junior high school. Success in this issue, as well as general progressiveness in different features of school work is attributed in part, at least, to very live parent teachers associations in each of the elementary schools.

We have just received from the Oregon State Department of Education a 1922 bulletin on the Club Work of Oregon Boys and Girls. The foreword perhaps best explains the contents of the bulletin: "This little book contains the stories of achievement by boys and girls in the Oregon schools, who triumphed over difficulties in completing an industrial project." The bulletin is copiously illustrated and contains much material that will be an inspiration to other boys and girls of the state.

Superintendent E. W. Small, Warehouse Point, Connecticut, has furnished us with blanks which his teachers are using in hygiene reports this year. Heads, Hands and Nails, Face, Teeth, and Neatness are the items considered. A record is kept by the teacher of the number of children receiving credits or demerits both forenoon and afternoon each week. Special demerits are given for coughing or sneezing without protecting others, while special credits are given for treatment of eyes, tonsils, and adenoids. A banner goes to the room with the best report.

Second District No. 3, Colorado, fifteen miles wide and twenty-five miles long, includes the city of Fort Morgan and twenty-five rural schools. The district is under one superintendent, but the Board this year has employed a rural supervisor to have sole charge of the rural teachers. Every effort is being made to bring the standard of these rural schools up to that of the city. Intelligence and achievement tests are being used as means to this end. Isaac Stutsman is the superintendent, and Miss Florence Arbuthnot is rural supervisor.

The Department of Classical Languages at Ohio University (Athens) issues a monthly mimeographed bulletin of Latin News and Notes. The purpose is to assist teachers of Latin in finding material of interest to their classes, and to keep them fully informed of the latest movements in their field.

On the basis of seventeen Ohio schools, for which reports were available for both total enrollment and enrollment in Latin for the years 1919-20 and 1921-22, a notable increase in the proportion of the children studying Latin is shown. Of the total enrollment in these schools, 34.2 percent were studying Latin in 1919-20 and 42.4 percent in 1921-22.

Principal E. A. Ross of the Britannia School, St. James, Manitoba, has been applying some of our standardized tests. The results in both grades 5 and 6 on the Monroe's Diagnostic Arithmetic show our Canadian cousins above standard in practically every case. On Monroe's Reading the rate was slightly above standard, and comprehension slightly below. The results on the Monroe

and Buckingham Reasoning Arithmetic Tests were also slightly below standard. Mr. Ross says, "Of course the results are not up to American standards but this is the first time we have ever tested with anything of that nature and I am looking for a better showing when I give it again." We shall look forward with great interest to a later report from Mr. Ross, regarding the results of the second test.

An analyzed rating of fitness for graduate study from "An Open Letter to College Seniors, by Dr. Carl E. Seashore, Chairman, National Research Council" designates the following characteristics upon which one might be rated: reasoning power, originality, memory, alertness, accuracy, application, cooperation, moral attitude, health, zeal for investigation. He who on an honest self examination does not believe himself to rank high on these items may question the advisability of the expenditure of much time or money on graduate work.

The Los Angeles (California) High School Research Bulletin for February 27 lists the following eight journals as being the most representative periodicals dealing with educational research: Journal of Educational Research, Journal of Educational Psychology, School Review, Elementary School Journal, Teachers' College Record, Educational Administration and Supervision, American School Board Journal, and School and Society.

Miss Mary B. Cummings, Director of Department of Research, Fresno, California, reports that one of the most notable things accomplished in their school in the past year is the organization of their intermediate schools.

These intermediate schools are not junior high schools in the general sense of the word; rather, they are designed to care for children of twelve years of age or over who for any reason find themselves behind pupils of their own age. These schools offer the same courses in agriculture, shop, home economics, physical education, music, and the like that are given in the junior high schools, but offer no courses in foreign languages. They give special opportunities for more rapid progress in English. The schools have no grade designation. Children of foreign birth, or of migratory parentage, form the larger proportion of the children in these schools.

The Plattsburg program is an evidence that educational measurement is believed in extensively in New York state. The Plattsburg Teachers Association voted to use standard educational and intelligence tests as a means of studying their own work. After some correspondence with Mr. J. Cayce Morrison, specialist in educational measurements in the state department, the following program was decided upon: Terman Group Test of Mental Ability, all pupils, grades 9-12; Thorndike-McCall Silent Reading Test; Clapp's Standard School Tests in Correct English; Kirby Grammar Tests; Hudelson's English Composition Scale; Lewis Scale for Measuring Quality of Letters of Application; Henmon Latin Vocabulary and Sentence Tests; Hotz First Year Algebra Scales, Series B, Equation and Formula, and Addition and Subtraction; Min-

nick Geometry Test, Scale B; Rogers Tests for Diagnosing Mathematical Ability; Cleveland Survey Arithmetic Tests; Thurstone Clerical Examination; Van Wagenen American History Scales. This is the most extensive Measurement program in high-school grades, which has come to our attention. We hope for a later report from Plattsburg regarding the readjustment made on the basis of the findings and the results obtained.

A number of educational bills are before the New York Legislature; action may be taken before this appears in print. One bill provides for free text books, another for compulsory medical and dental instruction, a third requires a certificate of loyalty from teachers, and a fourth provides that a qualified teacher who is an alien may teach if application has been made for citizenship.

"College and University Administration," announced for early publication under the editorship of Professor Ralph L. Power of the University of Southern California, will contain a chapter on The Bureau of Educational Research by Dr. B. R. Buckingham of Ohio State University.

Another volume on vocational guidance under the same editor will also be announced shortly. The chapter on Educational Research will be written by Dean M. E. Haggerty, of the School of Education, University of Minnesota.

Superintendent W. E. Lutz, Morence, Arizona, indicates the interest which the School Board of that district has in the play-ground movement by requiring prospective teachers when applying for positions in the schools to answer the following questions:

1. Are you interested in the play-ground movement?
2. How much do you enter into the play of your pupils?
3. If employed here, do you agree to take an active part in the play of your pupils?

He also reports a new building in which stairways have been completely eliminated and which contains a combination stage-gymnasium forty by eighty feet. Superintendents who are forced to build under restricted financial conditions might do well to get in touch with Superintendent Lutz or call the attention of the architects who are planning buildings for them to the possibility of such a combination.

Our attention has just been called to Series A, Form II, of the Douglas Standard Test for elementary algebra published by the Bureau of Educational Research, University of Washington. The test consists of four parts: addition and subtraction, multiplication, division, and simple equations. The same bureau has also brought out Form A of the Gregory-Spencer Geography Test for grades six, seven, and eight. This test consists of eight parts in an eight-page folder. Part I is trade routes and their products; Part II, miscellaneous geography; Parts III and IV, causal geography; Parts V and VI, place and descriptive geography; and Parts VII and VIII, political and place geography.

Superintendent David Gibbs, Meriden, Connecticut, has sent us two pages of mimeographed material on the subject of spelling which he has placed in the hands of his teachers. These take up such phases of work as: (1) the conditions upon which correct spelling may depend; (2) the elements which must be observed in effective teaching; (3) the manner of conducting the spelling lesson; (4) order of work; (5) reviews; etc. Much of the best that has been gathered from scientific experimental work in the subject is thus placed in the hands of his teachers and has doubtless been a real service to them. We shall be greatly interested in receiving any material which superintendents and supervisors are giving their teachers to assist them in their work. We would like especially to have material which is a compilation or a digest of the results of experimental work in the various school subjects.

Investigation in Visual Instruction

An investigation is under way to evaluate visual methods of instruction, particularly motion pictures, including a study of the types of lessons to which visual material is best adapted, and of the best mode of its organization. The first and simplest procedure is to run parallel classes in which the various visual methods are compared with one another or with the oral method. A comparison is being made of the efficiency of visual instruction in various subjects, or topics within a subject. The results which are coming in from this study indicate that a careful evaluation of the newer methods should precede an adoption of them since they may not be superior to older and simpler methods. In fact, they may in some cases be a distinct disadvantage. The analytical study of the methods by which visual material may best be organized to produce more effective results is probably the more valuable study. It is more difficult, however, and is at the present time not so far advanced as the evaluation of present material. Its purpose will be not merely to determine how good present materials are, but to point the way to development of better materials.

F. N. Freeman

Chicago University

Reclassification in Reading

In order to solve the reading problem in the Jefferson School where three rooms contained children from II-B to VI-B inclusive, it was decided to regroup on the basis of results of measurement with the Burgess Reading Scale. All children were given the test and the results scored in terms of the number of exercises correctly answered. The three rooms contained 96 pupils distributed as follows: room two, 33 pupils in grades II-B, II-A, and III-A; room three, 27 pupils in grades IV-B and IV-A; room four, 36 pupils in grades V-B, V-A, and VI-B. Seventeen of the children from rooms two and three scored zero while fourteen from the three rooms scored one. These thirty-one pupils were placed in first- and second-reader groups. The twelve children who made scores of two and three were placed together in a third-reader group. Twenty children from three rooms making scores of four, five, and six were placed in the fourth-reader group. Eighteen children, including representatives from three

grades making scores of seven, eight, and nine, were placed in the fifth-reader group and the remaining fifteen from rooms three and four made up a sixth-reader group. By arranging the schedule so that the reading period occurred simultaneously in the three rooms the children were accommodated by passing to the room in which a majority of the particular group was reciting. By this scheme each pupil took reading with the group with which he could work most satisfactorily. As a result each of these teachers is having two reading groups and yet we feel that the needs of the pupils are being taken care of quite satisfactorily. We shall be interested to see the results shown by another measurement at the end of the semester.

MYRTLE L. KAUFMANN

Grade Supervisor, Logansport, Indiana

Errors in Fundamentals of Arithmetic

We have recently received from Dr. Osburn, Director of Educational Measurements in the State Department of Public Instruction of Madison, Wisconsin, a report on the study of errors in the fundamentals of arithmetic. The study is based on the report of tests given to over 21,000 children in grades three to eight. Roughly two-thirds of all children made errors. The distribution is somewhat irregular through the grades, the greatest percent (81) being made by the fourth grade, and the lowest (57) by the sixth grade.

Typically wrong answers occurred in practically all grades and many of them point clearly to the incorrect mental activity. For example, 90 as the answer for the sum of 70 and 29 indicates that some children get zero as the sum of nine and zero. In handling denominate numbers, it is evident that in many cases they were treated as abstract numbers. The following percents are significant and it will certainly be worth while for teachers to check roughly their own classes to ascertain what members are perhaps making the same type of errors. In addition 18.3 percent failed to reduce the answer to proper terms; 11.1 percent added the numerator of fractions for a new numerator and the denominator for a new denominator; 8.2 percent failed to carry; 3.0 percent failed to use the decimal point in subtraction; 15.7 percent failed to pay back where there had been a case of borrowing; 10.4 percent failed in decimal fractions by writing the apparently smaller number under the apparently larger one; 9.1 percent treated denominate numbers as abstract numbers; 9.8 percent reversed the subtraction, for example, eight from eleven gave seventeen. In multiplication 11.3 percent of the errors were due to failure to place the decimal point; 9.8 percent due to failure to multiply by the fractional part of the mixed number; 5.5 percent are the type $A \times 0 = A$. In division, 7.2 percent were due to subtraction instead of division—apparently a failure to observe the sign which was given.

The following quotation from the report summarizes the situation: "Since all the studies point so clearly to the same set type of errors it is evident that those who would improve the achievement of their pupils in the fundamentals of arithmetic should provide an abundance of suitable drill for these special difficulties. The following points are particularly worthy of notice. The comparisons of numbers above the 5's are more difficult than those

below. Comparisons in addition whose sum exceeds ten are generally more difficult than those whose sum is less than ten. Carrying and particularly borrowing are difficult. Zero combinations are troublesome in all grades. In division a number divided by itself is often mixed. In fractions children are very apt to confuse multiplication and division with addition and subtraction. The results of the test point conclusively to the fact that more attention should be given to denominate numbers."

Rural Education in Pennsylvania

From 1900 to 1919 inclusive 722 one-room schools in this state were closed, generally by annexing one district to another. It was a process of consolidation but not a very effective one. During the past two years 1043 one-room schools have been closed through a more effective system of consolidation.

The Bureau of Rural Education was organized to effect consolidations wherever possible and to administer to every need of rural education. We shall always have a large number of one-room schools in a state like Pennsylvania for in some of the mountainous regions the topography of the country, the climate, the sparsity of population, the highways, etc. are obstacles to consolidation. In such places we shall continue to maintain one-room schools. It is our plan, however, to make them the best schools of that type. Our Rural Education Bureau is preaching the gospel of consolidation and showing to the people how improved buildings, equipment, properly trained teachers, and adequate courses of study contribute to the improvement of rural life and to agricultural interests. We are putting the question of consolidation squarely before the communities which are interested. We are not saying to a single community that it must consolidate its schools. We are pointing out the advantages that come to rural life through consolidation and the better schools afforded thereby. In several communities we have been able to effect consolidations which will enable the communities to maintain a six-year elementary course, a three-year junior high school course, and a three-year senior high school course. In addition thereto, special teachers of art, music, health, home economics, and agriculture are provided. We are trying to show the people of these communities how the school can be made a contributing agency to the home and how the home may be advantageously connected with the school.

In many cases consolidated schools may be maintained at less expense than the one-room schools; in many other cases the expense of maintenance will be more. Whatever the facts may be, they are set before the people who are then left to determine for themselves whether or not they want the modern type of school.

As a result of this kind of program in connection with rural education, we have been able to establish 128 consolidated schools in the last year and a half.

Representatives of our Rural Education Bureau attend all public meetings which may serve the community interests, such as community meetings, the Grange, parent-teachers' associations, mothers' clubs, federated clubs, farmers' institutes, commencements, special school gatherings, and meetings of school directors. The staff of our Rural Education Bureau will aid any community

in the establishment of parent-teachers' associations and other community enterprises.

THOMAS E. FINEGAN
State Supt. of Public Instruction

A Problem Test in Geography

(A preliminary statement)

Although the main function of a geography test is to measure the ability of the pupil, it is quite possible that the test may also influence the teaching of the subject. If a teacher is constantly having her work measured by location tests, she will undoubtedly be led to over-emphasize place geography and to neglect the more important geographical relationships.

Modern teaching of geography emphasizes the study of problems in human relationships. The new Detroit course of study in geography gives a series of problems for each of the important countries. For example, when South America is studied, one of the problems for study is: "We should establish close trade relations with South America. Why?" References are given to textbooks and the children are given an opportunity to find answers.

The following test, which is called "Best Reasons," has been devised to measure the ability of the pupil to make judgments on geographical data. The exercises given here are mostly limited to physical geography, but they indicate the possibility of measuring this sort of ability.

In May, 1921, the ten exercises below, together with twenty others, were given to 2,921 children of grades two to eight inclusive in four different cities. First the children did a trial test consisting of three exercises, and then they did the real test. Essentially the directions were: "Put a cross in the parentheses in front of the best reason or cause in each exercise. You will have plenty of time to finish as many as you can do."

TEN SELECTED EXERCISES

(Make a cross in the parentheses before the best reason or cause in each exercise.)

1. Tides are caused by:
   ( ) 1. Movement of ocean currents.
   ( ) 2. The seasons of the year.
   ( ) 3. The attraction of the moon and sun on different parts of the earth.
   ( ) 4. The inclination of the earth's axis at an angle of 23½ degrees.

2. It may snow at the top of a mountain and rain in the valley because:
   ( ) 1. The high mountains are covered with snow.
   ( ) 2. It is colder at high altitudes.
   ( ) 3. The people in the valley would rather have rain.
   ( ) 4. The air is denser on the mountain top.

3. The temperature is hot at the equator because:
   ( ) 1. The rays of the sun are more nearly vertical at the equator than elsewhere.
   ( ) 2. The days are longer than the nights at the equator.
   ( ) 3. There are few high mountains near the equator.
   ( ) 4. Very little snow falls at the equator.

4. Ireland is known as the Emerald Isle because:
( ) 1. The dry ocean breeze keeps it so warm.
( ) 2. Many emerald mines are in Ireland.
( ) 3. Ireland has much sunshine.
( ) 4. Warm rains keep the vegetation green throughout the year.

5. In the United States the days are longer in June than in December because:
( ) 1. The earth is nearer the sun at this time.
( ) 2. The earth rotates faster at the equator than at the poles.
( ) 3. The vertical rays of the sun are farther north in June than in December.
( ) 4. The rotation of the earth is very slow in June.

6. Nevada has light rainfall because:
( ) 1. The climate in Nevada is too warm.
( ) 2. There are many deserts in Nevada.
( ) 3. The crops can be cared for by irrigation.
( ) 4. The moisture is lost before the winds cross the mountains.

7. Isotherms are more nearly parallel in the Southern Hemisphere than in the Northern Hemisphere because:
( ) 1. It is warmer in the Southern Hemisphere than in the Northern Hemisphere.
( ) 2. There is less rainfall in the Southern Hemisphere.
( ) 3. The Southern Hemisphere is mostly water and therefore has a more constant temperature.
( ) 4. The days are longer than the nights in the Southern Hemisphere.

8. The air in a heated room is always warmer at the ceiling because:
( ) 1. In very high altitudes the air is light.
( ) 2. Warm air holds more moisture than cold air.
( ) 3. Cool air becomes dry when heated.
( ) 4. Warm air is lighter than cold air and therefore rises.

9. The irregular coast of southern Florida is due to:
( ) 1. The shifting of sand.
( ) 2. Volcanic eruptions.
( ) 3. The work of coral polyps.
( ) 4. Sinking of the coast line.

10. Switzerland is called the playground of Europe because:
( ) 1. The Swiss do not work.
( ) 2. Switzerland is so small.
( ) 3. Switzerland has a small standing army.
( ) 4. People of all nations spend their vacations there.

Table I gives the percent of correct responses for the different exercises in grades five, six, seven, and eight. For example, the first line of the table gives the percent of correct responses for the first exercise (Tides are caused by, etc.). This exercise was answered correctly by 19 percent of the pupils in the fifth grade, by 25.5 percent in the sixth grade, by 32.5 percent in the seventh grade, and my 41.5 percent in the eighth grade. The last line of the table gives the number of pupils participating in each of the grades. A

study of the table will show that there was an increase in the percent of correct responses in each successive grade on all exercises except number nine upon which the percent was the same in grades seven and eight. This indicates that the judgment and information of the pupils increased with school experience.

TABLE I.

PERCENT OF CORRECT RESPONSES TO CERTAIN EXERCISES IN THE "BEST REASONS" TEST IN GEOGRAPHY

Number of Exercise	Percent of Pupils Making Correct Responses			
	Grade V	Grade VI	Grade VII	Grade VIII
1	19	25.5	32.5	41.5
2	39	55	65.5	74
3	70.5	82.5	87	92
4	27	39	44	51.5
5	26.5	27	40.5	45.5
6	43.5	62.5	77.5	78.5
7	25	30	41.5	54
8	58	64	71	84.5
9	11	17	19	19
10	51.5	52	66	71.5
Total Number of Pupils	585	910	925	501

The average geography teacher will no doubt think that a better method of obtaining answers to a question as to why Nevada has a light rainfall is to allow the pupils to write their own answers. The scoring of these answers, however, is almost impossible. Anyone who has attempted to score such questions as those given in the Hahn-Lackey scale will be convinced that this is true. Perhaps the Best Reasons test does not allow for the initiative of the very brightest pupils in stating reasons, but it does permit an absolutely objective method of scoring.

It is quite possible that some of the exercises of this test are not highly important. However, the method used can be adapted to questions, the answers to which children of the elementary school should know. The following questions, which are more definitely concerned with human relationships than those given above, are suggestive of additional exercises for use in such a test:

1. Why has the growth of Chicago been so phenomenal?
2. Why are the Southern States and New England States dependent upon each other?

3. Why will the industries of France be greatly aided by the return of Alsace-Lorraine?
4. Why is great care being taken in the construction of buildings in San Francisco?
5. Why is the production of motion pictures an important industry in Southern California?
6. Why do baseball teams have their early spring training in cities like Atlanta, Georgia?
7. Why has Switzerland been able to maintain its independence for so many years?
8. Why is India a very important possession of the British Empire?
9. Why is the Panama Canal of great advantage to New Orleans?
10. Why are there so many small nations in Europe?

P. R. STEVENSON

Ohio State University

Educational Research Association

(Frank N. Freeman, *Secretary and Editor*)

NINETEEN TWENTY-TWO MEETING
FEBRUARY 28 TO MARCH 2, 1922

The Eighth Annual Meeting of the National Association of Directors of Educational Research was the largest in the history of the association; largest in the number of members attending, largest in the extent of the program, and largest in the total number of persons who were attracted to the programs. As has been true for several years, the room allotted us for the open meetings was too small to seat the number of persons who wished to profit by the reports made. That the papers were both interesting and valuable was perhaps best attested by the extent to which both men and women stood attentively during their presentation.

The Open Meetings

The program on Tuesday afternoon was equally divided between reading and general intelligence work. Doctor A. I. Gates of Teachers College, Columbia, reported a study, highly analytical in character, of reading and spelling with special reference to disability, showing how such a careful study was of value to the teacher in discovering the difficulties of individuals and in enabling her to apply remedial work more effectively. Doctor C. T. Gray of the University of Texas reported on the anticipation of meaning as a phase of reading ability. The working out of the problem involved the devising of a considerable amount of laboratory apparatus and was of a nature quite impossible for use in the classroom. However, the results secured should be utilized by the classroom teacher, and we shall await the publication of the paper with a great deal of interest. The paper by Doctor G. T. Buswell of the University of Chicago was another of the highly technical papers of the conference. While it is useless to try to give a synopsis in this brief report, the work of which his paper gave but part, gives promise of a series of scales to be used by the teacher in the development of certain types of reading habits.

Assistant Superintendent Dawson's report on classifying kindergarten children by means of the Binet test and Mr. Kallom's on intelligence and the classroom teacher were concrete examples of the practical use of intelligence tests. The large number of superintendents who heard these papers should have been encouraged to do such work if they had not already tried it. Doctor Franzen of the Des Moines (Iowa) public schools presented the results of an extensive study of intercorrelation of some fifteen intelligence tests, seeking to determine their relative validity and thus point out to school people in general the tests from which the most reliable results might be expected. The conclusions seemed to point to the National Form B and the Terman Group as the best among the group tests now available.

Four of the six papers scheduled for Wednesday afternoon were on curriculum problems. Doctor Charters was unable to be present but his paper will appear in an early number of the Journal. Doctor Horn's paper on comparison of reading, writing, and pre-school spoken vocabularies emphasized the fact that researches had shown a great similarity between these vocabularies; that they were much larger than ordinarily conceived, but that one's guess as to whether a particular word would be found among those of any one list was very likely to be wrong. Doctor Caldwell presented the work that he and his colleagues are doing at the Lincoln School in music and biology in sufficient detail to make clear that a curriculum scientifically built upon social needs is a task of great proportions. Miss Zirbes in discussing the relationship of measurement to pupil progress and curriculum research in reading, called pointed attention to the fact that there was real need for measurement to assure progress when the materials of instruction were being experimentally determined.

The other two papers were of a very different type, though no less scientific. Miss Schmitt presented a careful analytical paper on temperament and attitude as factors in school progress, portraying the different types of each and discussing the teacher problem in successfully handling each. Doctor Freeman spoke forcibly for research instead of propaganda in visual education and cautioned school men to look for the former and beware of the latter. He also pointed out the lines along which research promised definite results.

Since there was a vacant place on the program, Mr. Courtis who is always welcomed on our programs, was given an opportunity to present some material on individual work in primary reading. In his scheme, each child is given a specially prepared dictionary with which he works out the story in a little reader. It is an effort to enable each child to do his own work and progress at his own rate.

On Thursday afternoon, Dean Chadsey who had promised to preside was prevented from doing so by illness and President Rugg pressed Doctor Buckingham into service. The scheduled numbers of the program were all given except that by Mr. Packer, who was not present. Superintendent Washburne of Winnetka presented in some detail the individual instruction method which he is using and endeavored to show that the formulation of materials was the largest problem confronting those who really wished to care for individual differences. He paid his respects to the "socialized recitation" as follows: "We do not have socialized recitations because there isn't any such thing and can't be. If it is a recitation, it isn't social and if the activity is social, it isn't a recitation." Superintendent Washburne's paper was published in the last issue of this journal.

Doctor Knight of Iowa gave the paper which was published in the March number of this journal. Our readers are referred to it. Doctor Counts of Yale discussed the sociological character of the secondary-school population and showed that, while the schools are democratic in theory and support, they are not attended by children of all social groups in proportion to the number of children within those groups.

Doctor Strayer presented methods and problems of research in the field

of educational finance and forecast a great service to the schools of the nation as a result of the inquiry now under way. Doctor Cubberley presented phases of research in county and state school administration, sketching briefly the development of school administration in this country and pointing clearly to the next steps that must come.

The Meeting Thursday Evening

The last meeting of the association was the dinner which was held on Thursday evening. The solidarity and *esprit de corps* of the society is indicated by the fact that a large proportion of the members who were in attendance at the meetings stayed over for the dinner. Those who did attend were amply repaid by both the light and the heavy intellectual refreshments.

The light refreshments comprised a considerable amount of general chaffing and the presentation to the company of a new intelligence test and a new spelling test. We learned that, while one member bore the title of Head of the Bureau of Reference and Research, his duties seemed to have little to do with research (accent on the last syllable), and that another member, who bore the same title, confessed that he could offer no references. The president demonstrated a new intelligence test, the percentile value of which as estimated from the percentage of failure in the group would be about .99. Another member presented a spelling test of ten words and made a sporting proposition. The full details of this matter are reserved for publication in a monograph.

The business meeting was held during the course of the dinner. The following officers were elected: President, W. W. Theisen; Vice-president, E. J. Ashbaugh; Secretary-treasurer, Frank N. Freeman.

There was some discussion of the division in interest among the members of the association in the type of paper or discussion which should be presented at the meetings. This problem is somewhat akin to the question concerning the kind of articles which should be accepted for the Journal. The discussion brought out the fact that the problem both of the meetings and of the Journal involves the relation of the association to other associations of similar nature and purpose. In order that these questions might be thoroughly canvassed one committee was appointed to consider the journal problem and another to consider the meeting problem. Both committees are to report at the next meeting.

The executive committee is taking steps toward incorporation as directed by the association.

The constitution or by-laws or some resolution, I am not sure which, provides that the president shall deliver an address at each annual meeting in which he sums up the progress in educational research for the preceding year. The president gave us full measure this year by reviewing the entire modern scientific movement in education. He displayed on a large chart the various trends showing their origins and parallel chronological development. This chart went so far into detail as to give the names of representative workers in the various types of research such as the study of administrative problems, educational measurement, and the investigation of learning. The meeting unanimously requested Doctor Rugg to publish his chart in the Journal of Educational Research, which he plans to do.